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Demerol Analgesia In Obstetrics*

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IT may sound strange to say that the medical profession is still in quest of a satisfactory and constantly applicable method of analgesia for the pain of childbirth in view of the dramatic relief offered by continuous caudal analgesia. After reading some of the enthusiastic reports on continuous caudal analgesia, one is likely to conclude that the suffering of parturition has been finally abolished. But it must be pointed out that this procedure is not universally applicable because of certain limitations. It is a highly technical procedure requiring special training and a great deal of practice, and adaptable to patients only in well staffed obstetrical institutions. It demands constant attendance and supervision by the obstetrician during the entire course of its administration.

Despite perfect technique and proper selection of patients, caudal analgesia fails to produce relief of pain in a certain percentage of cases and many patients refuse the procedure because of fear or prejudice. Most important, caudal analgesia carries a definite risk to the patient's life, even in the best of hands, as shown by occasional maternal complications and deaths due directly to the procedure. For these reasons other forms of obstetrical analgesia are still being sought, especially by physicians who do not find optimal conditions in their communities for routine use of caudal analgesia. The shortage of doctors and nurses during the present crisis, and the consequentially greater demand on their time by patients, has certainly curtailed their ability to remain with parturients during the entire course of caudal analgesia.

Doctors and nurses were in short supply in the Sonoma County Hospital, as elsewhere, during the past two years. Hence, a method of analgesia was sought that would produce the desired relief

from pain during labor and at the same time be safe for mother and child and be relatively easy to administer and supervise. After several agents had been tried, Demerol was chosen as the drug meeting such specifications.

From the number of reports in three years on the use of Demerol, alone or in combination with some other agent, it is evident that the drug has already assumed an important place in obstetrics. After a preliminary report by Roby and Schumann² of the Boston Lying-in Hospital, the latter¹ presented a thorough study of 1,000 labors conducted under Demerol-scopolamine analgesia, with an inhalant for actual delivery. In view of the satisfactory amnesia, absence of pulmonary complications, and freedom from depressant effects on the fetus, Schumann concluded that Demerol in conjunction with scopolamine is superior as an obstetrical analgesic to other analgesics in common use. In December, 1945, Carter³ reported a series of approximately 2,700 cases from three hospitals in Madison, Wisconsin, in which, after a small preliminary dose of a barbiturate, analgesia was obtained by Demerol-scopolamine, with delivery under nitrous oxide and oxygen. Carter considers that Demerol combined with scopolamine or some other agent is not surpassed by any drug or method now in use.

DEMEROL

Demerol, or ethyl 1-methyl-4-phenylpiperidine-4-carboxylate, is a synthetic agent exhibiting properties comparable to those of both morphine and atropine; the analgesic power is close to that of morphine and the spasmolytic action weaker than that of atropine. It differs from morphine in that it relaxes smooth muscle. The appealing property from an obstetric standpoint is the apparent absence of any significant depressant action on the patient. Uterine contractions are not slowed and the spasmolytic action on the

* Read before the Section on Obstetrics and Gynecology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

cervix is evident by the rapid dilatation of that organ during labor. Demerol was reported to produce a slight elevation of the blood pressure, especially in toxemic patients, but Carter found little noticeable effect on pulse or blood pressure. The risk of addiction is negligible in the amounts employed obstetrically.

Adequate amnesia is not always produced by Demerol alone, as several investigators⁴ have found, but the addition of scopolamine or a barbiturate generally results in a high percentage of amnesia. Scopolamine is preferred, since there is practically complete freedom from the crises of pulmonary edema seen occasionally with barbiturates. Moreover, Schumann states that the psychic sedation obtained by Demerol through its analgesic effect provides a favorable background for the action of scopolamine, reducing excitement and enhancing amnesia. In most reports, the usual dosage of Demerol was 100 mg. administered intramuscularly when the patient became uncomfortable. Additional doses were injected at intervals thereafter. Less relief was provided by oral administration. Mild side-effects rather frequently follow intravenous administration of Demerol, but the rapid control of pain and increased amnesia effects procured through very slow intravenous administration offer definite advantages, particularly in multiparas. In the present study the intramuscular route was used exclusively.

MATERIAL

Demerol was administered to 300 women in labor at the Sonoma County Hospital between February 1, 1945, and April 1, 1946. These patients were unselected, except that the drug was not given to any patient with toxemia. So far as it is known, toxemia is the only contra-indication to the use of Demerol in obstetrics. A total of 307 infants was born to the 300 mothers, as follows:

Type of Delivery	Number	Percentage
Spontaneous	233	77.6
Low forceps	40	13.3
Breech Extraction	10	3.3
Mid-forceps	7	2.3
Twins	5	1.6
Version and extraction	4	1.3
Triplets	1	0.6

A control group of 300 similar patients was given nembutal, seconal, paraldehyde, diaz and scopolamine in varying combinations and doses.

In addition to these 300 vaginal deliveries, there were 14 Caesarean Sections premedicated with Demerol. Because the problem of labor was not present in the majority of this group, it will be discussed in a separate section.

METHOD OF ADMINISTRATION

The following routine of administration was adopted: Demerol 100 mg. and scopolamine 0.48 mg. (1/150 grain) were given intramuscularly as soon as the patient in active labor began to complain, regardless of the degree of cervical dilatation. This combination was repeated in three hours, and Demerol alone given in 100 mg. doses

at three-hour intervals thereafter until the patient was ready for delivery. An attempt was made not to give Demerol or scopolamine within an hour of expected delivery as an additional precaution against possible fetal anoxia. As the study progressed, it was found that Demerol given within an hour of delivery produced no demonstrable depressant effect on the child, whereas the combination of Demerol and scopolamine given similarly resulted in several "slow" babies, that is, babies which required more than the routine measures of resuscitation. The more apprehensive patients were given 0.1 gm. of nembutal or seconal (1½ grains) by mouth at the same time the original dose of Demerol and scopolamine was administered. The barbiturate was not repeated thereafter during labor. This group of patients appeared better sedated than those receiving Demerol and scopolamine alone, and the infants showed no unusual depression. However, the number was too small to permit any valid conclusion.

Of the 300 patients, 250 required but *one dose* of Demerol for their entire labor; 40 patients were given *two doses*, 7 received *three doses*, and 3 had *four doses* or a total of 400 mg. In nearly all cases nitrous oxide and oxygen were used during the second stage of labor. Certain difficult deliveries necessitated continuous nitrous oxide and ether anesthesia. Most of the episiotomies and repairs were performed under pudendal block and local infiltration with 1 per cent Novocain solution.

EVALUATION OF ANALGESIA AND AMNESIA

In the great majority of patients, Demerol and scopolamine produced relief of pain and evidence of sedation within from 15 to 20 minutes after intramuscular administration. The patient usually relaxed, stopped crying and complaining, and fell into a light sleep, rousing somewhat during the pains. The analgesic effect lasted from two to six hours, averaging about three hours.

The patients were interviewed a day or two after delivery for their memory of labor. On the basis of the interview, they were divided arbitrarily into those having (1) complete analgesia and amnesia, (2) satisfactory analgesia, and (3) unsatisfactory analgesia. In the first group fell those having completely painless childbirth without the impingement on the patient's memory of pain or suffering following the administration of Demerol. In the satisfactory group were placed those who remembered isolated incidents during labor but whose suffering was markedly or completely relieved. This group also included patients who volunteered satisfaction with the method and those who referred other patients asking specifically for Demerol in their forthcoming deliveries. Patients with borderline analgesia were not placed in this group. The unsatisfactory group included those claiming no relief with Demerol, the ones who received medication too late in labor for effective action, and those who did not receive the drug according to plan.

Complete analgesia and amnesia was obtained in 126, or 42 per cent, of patients and satisfactory analgesia in an additional 182, or 44 per cent. This gave a combined total of 86 per cent with satisfactory analgesia. In the third group there were 42 patients, 14 per cent, who failed to obtain adequate relief or who did not receive the drugs soon enough or according to plan.

In contrast, only 48 per cent of the control patients obtained satisfactory sedation with the barbiturates, paraldehyde and scopolamine and 52 per cent had unsatisfactory analgesia. The uncorrected 86 per cent incidence of satisfactory sedation in the Demerol-scopolamine treated patients would undoubtedly have been higher had medication been administered earlier or according to plan in the remaining 14 per cent.

LENGTH OF LABOR

The most interesting observation in the majority of the Demerol patients was the rapid cervical dilation that occurred after medication. It was not at all unusual for a primiparous cervix to progress from a dilation of about 2 cm. to complete dilation in the space of from two and one-half to three hours after injection of Demerol.

In the group of 165 primiparas, the length of labor averaged 11.2 hours, as compared with 15.4 hours' labor in the control primiparas. In 135 multiparas, the duration of labor was, on the average, 7.0 hours. The duration of labor in the control multiparas was 9.2 hours. Hence, labor lasted 4.2 hours less in the primiparas and 2.2 hours less in the multiparas treated with Demerol, as contrasted with the control series, reductions of 27 and 24 per cent, respectively, in the duration of labor. Stated differently, about 85 per cent of Demerol-treated patients were in labor for less than four hours after administration of the drug. While it is obvious that a few relatively long or short labors might alter considerably the average figures in a comparatively small series of patients, the same conditions also held in the control series of 300 patients.

UNTOWARD EFFECTS

No untoward effects of any importance were observed. It is possible that these were avoided by not giving the drug intravenously. The following transitory side reactions were noted: Dryness of the mouth and throat in 82 per cent, nausea in 28 per cent, dizziness in 14 per cent, diaphoresis in 12 per cent, vomiting in 6 per cent, and excitement in 4 per cent of the subjects. By way of contrast, the manic state was observed in over 20 per cent of the control subjects given barbiturates and paraldehyde analgesia. There were no instances of edema of the uvulva or glottis, as recently reported by Steinberg⁸ after Demerol-scopolamine analgesia and attributed in all probability to scopolamine. The absence of edema of the uvulva in the present series may be due to the fact that minimal amounts of scopolamine were used. There was

no significant evidence of narcotic depressant action and most patients were completely oriented within three hours after delivery. Usually they were able to converse and answer questions during the period of sedation, but little memory of this was retained afterward.

RESULTS IN INFANTS

Schumann's method of classifying the infants according to their condition upon delivery was followed. *Group A* includes those who breathed spontaneously and required no treatment other than the usual inversion and aspiration of the upper airway with a rubber ear syringe. *Group B* includes slightly slow babies who required oxygen and a warm tub in some instances but who respiration spontaneously within two minutes. *Group C* babies required more than two minutes of resuscitation before breathing spontaneously. Persistent damage was evaluated in these before discharge. *Group D* included all neonatal deaths, and *Group E* the stillborn infants. Of 307 infants, 293 or 95.4 per cent, belonged in Groups A and B. Of the eight *Group C* infants, six had definite obstetrical causes other than analgesia in the mother to explain their slow response. Since no obstetrical factor was present, it is possible that the analgesia can be implicated in the slowness of the other two babies. All eight infants were discharged in good condition. The three neonatal deaths were due to asphyxia from premature separation of the placenta, congenital malformation of the heart, and difficulty during version and extraction in an attempt to correct a transverse lie with a prolapsed arm. The three causes of death in the stillborn were erythroblastosis fetalis, asphyxia due to premature separation of the placenta with a large concealed hemorrhage, and asphyxia and intrapartum death due to a difficult breech extraction. From this analysis it is apparent that obstetrical factors other than analgesia could account for all the stillborn and neonatal deaths and for all but two of the slow *Group C* babies.

PREMATURE INFANTS

Since the depressant action of any obstetrical analgesia would be most evident among premature infants, these were studied separately. A fetal weight of less than 2,500 gm. was the criterion of prematurity. Of the 24 premature infants, 20 were classified according to their condition at delivery in *Groups A* and *B* and only four infants were in *Group C*. However, obstetrical factors other than analgesia were found to account for the slowness of respiration in all four infants. It would appear that Demerol-scopolamine analgesia has no more effect in premature infants than in those of normal weight.

CAESAREAN SECTION

Fourteen patients, delivered by caesarean section, were given 100 mg. of Demerol and 0.48 mg. (1/150 gr.) of scopolamine about an hour prior to induction of general or local anesthesia. Four operations were performed under local and

ten under general anesthesia with nitrous oxide and ether. Induction of general anesthesia proceeded quite smoothly in these patients and mucus in the respiratory passages was conspicuous by its absence. Sedation and amnesia were effective in patients who were operated upon under local anesthesia. The indications for caesarean section were:

Previous caesarean for cephalopelvic disproportion	6
Large ovarian tumor complicating pregnancy	1
Small android pelvis and large fetus	1
Placenta previa complicating twin pregnancy	1
Central placenta previa	1
Dystocia due to cephalopelvic disproportion with adequate trial of labor	4

The first eight were elective procedures and the remainder operations of necessity.

There were no maternal or fetal deaths, and of the 15 infants delivered, all but two were classified as Groups A and B infants. There were adequate obstetrical reasons to explain the slowness in the remaining two babies (central placenta previa with considerable blood loss and a difficult labor of 48 hours). The absence of anoxia was striking in these babies.

SUMMARY

1. Demerol and scopolamine were used for obstetrical analgesia in 300 patients at the Sonoma County Hospital.

2. Satisfactory sedation was produced in 86 per cent of the series, as compared with 48 per cent in the control group given barbiturates, paraldehyde and scopolamine in various combinations.

3. The average length of labor was 4.2 hours shorter in the primiparas and 2.2 hours shorter in multiparas given Demerol and scopolamine, than the average labors in the control group.

4. No untoward effects of importance were observed in the mothers. Mild transitory side effects consisted of dryness of the mouth and throat, nausea, dizziness, diaphoresis, vomiting, and excitement. The latter was observed in only 4 per cent as contrasted with an incidence of over 20 per cent in control patients treated with paraldehyde and barbiturates.

5. No depressant effects were observed in 307 full term and premature infants delivered vaginally.

6. The combination of Demerol and scopolamine provided an adequate and safe preanesthetic medication in a small group of caesarean sections. The absence of fetal anoxia was striking.

CONCLUSIONS

The combination of Demerol and scopolamine, as used for obstetrical analgesia, provides satisfactory relief of pain and amnesia, is safe for both mother and child, and is uncomplicated to administer and supervise. It is the most satisfactory analgesic combination employed in labor at the Sonoma County Hospital. For these reasons, it merits a wider trial by the medical profession.

DISCUSSION BY CHARLES A. ISHAM, M.D.:

I wish first to congratulate Dr. Maximov upon his excellent presentation. This subject has been adequately covered by his paper. There are a few points that can be emphasized.

In regard to caudal anesthesia, there is no argument but that this type of medication is very excellent, but it still remains that it is of very little practical use to the average private practitioner of obstetrics. Its use is chiefly limited to isolated cases or as a "one shot type" of terminal anesthesia. It has found an excellent use in the larger institutions where constant observation by house staff can be maintained, this being obligatory with this type of medication.

I have used Demerol for the last few years and have had a chance to watch its efficacy in labor. For this discussion four hundred cases were surveyed from Mercy Hospital in San Diego. This institution has entirely private cases, and there are no clinic patients available so that these patients were delivered by a large number of obstetricians. For this reason any statistical survey was entirely without any valid conclusions due to the smallness of the number after breakdown. Demerol was administered with every type of drug. Questionnaires were sent to these patients, all receiving them within a few months of their delivery. The main question was one regarding remembrance of facts during their labor. Twenty-seven per cent of 289 replies had a total amnesia, and upon investigation of this number it was found that the Demerol was given with barbiturates and scopolamine in those patients obtaining amnesia. Over 90 per cent, however, volunteered the information that the medicine was definitely of aid in their labor.

There were no appreciable severe reactions nor side effects from the administration of Demerol. The few reactions obtained were those of nausea and vomiting and slight dizziness which soon passed off. There were no fetal deaths that could be attributed to Demerol. The cyanotic infants obtained were definitely a result of other obstetrical complications.

There seemed to be much less of an "unruly" reaction on the part of the mother when receiving Demerol than with other types of agents, such as the barbiturates alone with scopolamine or paraldehyde. In 150 personal cases there were only seven "unruly" reactions, or an incidence of approximately 4 per cent.

We have found that the administration of seconal in 0.1 gm. or 0.2 gm. (1½ or 3 gr.) dosages and scopolamine with the first dosage of Demerol has a quieting effect and gives a very satisfactory amnesia in a large majority of cases.

DR. MAXIMOV (CLOSING)

I am aware that many writers proposing new analgesics for parturition are inclined to be enthusiastic about their particular agent. It is possible that this report has the same human failing. I would like to stress, however, that I am not advocating the use of Demerol and scopolamine to the exclusion of many other excellent anal-

gesics in common use today. Nevertheless, I am convinced that Demerol can be successfully employed in conjunction with other analgesics, or in their place, if contraindications to the other methods are present.

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Treatment of Thrombo-Embolism[†] By Vein Interruption

HOMANS¹ has called attention to "bland thrombosis" of the leg veins as a common cause of pulmonary embolism. He advocated vein ligation for the prevention of embolism after the thrombus has formed. Ochsner and DeBakey² have designated this type of vein thrombosis as "phlebothrombosis" to differentiate it from acute thrombophlebitis, in which the vein wall is actually inflamed and the thrombus is more apt to be adherent. On the basis that the leg veins are the source of the embolus in 95 per cent of the cases, Allen³ has performed a large series of vein interruptions and by this procedure has lowered the morbidity and mortality rates of pulmonary embolism and the incidence of chronic edema. He has also practiced preoperative prophylactic vein interruption in patients who could not be ambulated early.

That thrombophlebitis with its attendant edema in many patients is a late change of phlebothrombosis seems likely. Pulmonary embolism may be the only sign of phlebothrombosis, or there may be foot, calf or thigh tenderness, positive Homans's sign, slight cyanosis, mild edema, or evidence of vasospasm. Embolism is most apt to occur during the early stage and can be prevented by vein interruption. The picture of phlegmasia alba dolens is usually associated with edema, pain, fever and leukocytosis and, while the danger of embolism is not as great, the edema is more likely to persist than when associated with phlebothrombosis.

During the 26-month period between November 1, 1943, and December 31, 1945, 71 cases of thrombo-embolism were encountered on the University of California service at the San Francisco City and County Hospital. As indicated in Table 1, 25 of these patients had ligation of the iliofemoral venous system, 30 were treated by other means than ligation, and 16 of the cases were not diagnosed until autopsy and were not treated. The sex distribution was practically

equal, there being 35 males and 36 females. The ages ranged from 21 to 83, the average age being 54. Forty-six per cent occurred in the sixth decade, which again emphasizes the fact that advanced age, with its infirmities, is a predisposing factor to thrombo-embolism.

TABLE 1.—71 Cases Thrombo-embolism at S.F.H.
Nov. 1, 1943 to Dec. 31, 1945

Ligated	25
Nonligated	30
Thrombo-embolism at autopsy	16
Total	71
Male	35
Female	36
Age	21-83
Average age	54

Forty-three, or 60.6 per cent, of the 71 cases appeared on the medical service and 28, or 39.4 per cent, on the surgical service, as shown in Table 2. Of the 25 ligated cases, 13 were from the medical service and 12 from the surgical service.

TABLE 2.—Distribution of 71 Cases Thrombo-embolism
S.F.H. Nov. 1, 1943 to Dec. 31, 1945

	Medical Service	Surgical Service
Ligated cases	13	12
Nonligated cases	18	12
Autopsy cases	12	4
Total	43 or 60.6%	28 or 39.4%

Thrombo-embolism occurred postoperatively in 11 of the cases in this series, as shown in Table 3. In Table 4 is seen a list of the primary diagnoses in these 71 cases of thrombo-embolism. A review of these will emphasize the variety of illnesses that may be complicated by thrombo-embolism. As has been repeatedly pointed out, cardiovascular disorders rank high as predisposing factors in

TABLE 3.—Postoperative Cases in 71 Cases Thrombo-embolism S.F.H. Nov. 1, 1943 to Dec. 31, 1945

Gastric resection	2
Appendectomy	1
Oophorectomy	1
Cecostomy	1
Hernioplasty	1
Cesarean section	1
Abdominoperineal resection	1
Removal placenta	1
Drainage intra-abdominal abscess	1
Excision sarcoma leg	1
Total	11

* From the Department of Surgery of the University of California Medical School, and the University of California Surgical Service of the San Francisco Hospital, Division of the Department of Public Health.

[†] Read before the Section on General Medicine, Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

the development of thrombosis. Trauma, malignancy, and acute and chronic infectious processes contribute generously. Among those having cardiovascular disorders were 15 with arteriosclerotic heart disease associated with failure, four with coronary artery disease, five with rheumatic heart disease associated with failure, and two with luetic heart disease. Twenty patients in this group had severe cardiac failure at the time of development of the venous thrombosis.

TABLE 4.—Primary Diagnosis in 71 Cases Thromboembolism S.F.H. Nov. 1, 1943 to Dec. 31, 1945

Fracture tibia	1
Trauma	5
Severe burns	2
Cellulitis thigh	2
Varicose ulcer	1
Ca. esophagus	1
Ca. sigmoid	2
Lymphosarcoma	2
Sarcoma	1
Ca. cervix	1
Cirrhosis	2
Malnutrition & cachexia	1
Visceral angitis	1
Rheumatic heart disease with failure	5
Coronary occlusion	4
Arteriosclerotic heart disease with failure	15
Luetic heart disease	2
Arteriosclerotic gangrene extremity	2
Pneumonia	4
Diabetes	1
Pulmonary tuberculosis	2
Tuberculous peritonitis	1
Senile psychosis	2
Pregnancy & eclampsia	1
Asthma	1
Abdominal aortic aneurysm	1
Anemia	1
Bronchectasis	1
Gastric ulcer	1
Superficial thrombophlebitis	1

Mechanical trauma to the lower extremity with direct or indirect injury to the vessels was the causative factor in five patients. Venous thrombosis occurred following a period of bed rest in two patients having rather severe burns, of the extremities in one instance and the buttocks in the other. There were seven patients with malignancy and 11 with either acute or chronic infectious processes.

Table 5 shows the incidence of pulmonary embolism to be 48, or 67.6 per cent. In the group of 25 cases in which vein ligation was done, 20 patients, or 80 per cent, had pulmonary embolism.

TABLE 5.—Incidence of Pulmonary Embolism in 71 Cases Venous Thrombosis S.F.H. Nov. 1, 1943, to Dec. 31, 1945

	Cases	Embolism	Percentage
Ligated	25	20	80.0
Nonligated	30	15	50.0
Autopsy	16	13	81.2
Total	71	48	67.6

Of these, 15 patients had a single pulmonary embolus prior to ligation and five had multiple emboli. Two patients had a single small pulmonary embolus which occurred after bilateral ligation of the iliofemoral venous system; they were then treated with anticoagulants.

In this group of 25 ligated patients, three deaths were attributable to pulmonary embolism (Table 6). One patient who experienced a massive pulmonary embolism while undergoing

phlebotomy with attempted aspiration of an adherent thrombus expired six hours postoperatively. If iliac vein ligation had been done proximal to the thrombus in this patient, this fatal embolus might have been averted. If thrombophlebitis rather than thromboembolism is found, removal of the thrombus should not be attempted. Two other patients had had multiple pulmonary infarcts before ligation with development of a cor pulmonale and cardiac failure with subsequent death. Earlier ligation undoubtedly would have prevented infarction and subsequent cardiac embarrassment.

TABLE 6.—Deaths Attributable to Pulmonary Embolism in 71 Cases Venous Thrombosis S.F.H., Nov. 1, 1943, to Dec. 31, 1945

	Cases	Deaths
Ligated	25	3
Autopsy	16	6
Nonligated	30	7
Total	71	16

Pulmonary embolism occurred in 15 patients, or 50 per cent, who had no vein interruption. Ten of these had a single embolus and five had multiple emboli. Of the 15 patients who had pulmonary embolism, three expired from a single massive embolus. One of these expired 25 minutes after a paravertebral block and one died two days after a paravertebral sympathetic block. One patient who clinically had thrombosis of an external jugular and a brachial vein, together with bilateral thrombosis of the deep veins of the lower extremities, died from a massive embolus, the source of which was not determined. Another patient expired several days after the occurrence of a single large pulmonary embolus which contributed much to his cardiac failure and death. Of the five patients who had had multiple pulmonary emboli, two expired from cardiac failure secondary to development of a cor pulmonale and one from a massive embolus occurring during a thoracentesis. Of the 15 patients having had pulmonary embolism, seven, or 47 per cent, expired either from a massive embolus or from cardiac failure brought on by encroachment upon the pulmonary arterial tree by multiple emboli.

Of the 16 cases found to have thromboembolism at autopsy 13, or 81.1 per cent, had had pulmonary embolism. Of these 13 cases, five, or 31.1 per cent, had had a single fatal pulmonary embolus and in another case there had been a large pulmonary embolus that contributed to cardiac failure. In the seven remaining cases the infarctions probably contributed to but may not have been the major factor in the cause of death.

In the 55 cases that were clinically diagnosed the treatment consisted of conservative measures in 20, paravertebral sympathetic block in eight, anticoagulants in two, and iliofemoral venous ligation in 25.

As shown in Table 7, 43 vein ligations were carried out in 25 patients. Of these 43 ligations, 33 were carried out on the superficial femoral

vein, five on the common femoral, four on the external iliac, and one on the common iliac. Fourteen of the 25 cases had immediate bilateral ligation, a bilateral superficial femoral vein ligation being done in ten, ligation of the external iliac vein on one side and the superficial femoral vein on the other in three, and of the common femoral vein on one side and the superficial femoral vein on the other in one case.

TABLE 7.—*Ligations in 71 Cases Thrombo-Embolism S.F.H. Nov. 1, 1943, to Dec. 31, 1945*

Ligated cases	25
Ligations	43
Immediate bilat	14
Double ligation	1
Vein ligated	
Superficial femoral	33
Common femoral	5
External iliac	4
Common iliac	1

In 16, or 37 per cent, of the 43 vein ligations, a thrombus was encountered at the site of ligation. Ten of the thrombi were nonadherent and of the "bland" variety, and two were adherent to the intima. In four instances a thrombus was present but the vein was not opened. In one of these cases the thrombus was definitely adherent, and in the others it was probably nonadherent as determined by the operative description of the vein. In 11 of these 16 cases in which a thrombus was encountered at the site of ligation a phlebotomy with aspiration of the thrombus proximal to the opening was carried out with subsequent adequate backflow. This procedure was carried out on the superficial femoral vein in six instances, the common femoral vein in four and the external iliac in one case. In eight cases the thrombus in the vein distal to the opening was also aspirated in an attempt to improve the return of collateral circulation.

In the patients having had ligation of the superficial femoral vein minimal edema of the lower extremity was present at the time of discharge from the hospital in six instances, or 18 per cent of the 33 ligations. Of five patients with ligations of the common femoral vein two, or 40 per cent, showed moderate to minimal edema. Of those with external iliac ligations two, or 50 per cent, showed moderate edema, and the patient with common iliac ligation had persistent diminishing edema for several months postoperatively. The edema was improving in all the patients at the time of their discharge from the hospital. There were no instances of lymphorrhea.

It should be emphasized that the likelihood of postligation edema depends largely on the extent of the thrombosis or thrombophlebitis, the degree of collateral venous and perivascular involvement, the presence of vasospasm, the duration of the thrombosis, and a history of previous phlebitis. These factors seem more important to us than the ligation itself. Ligating a patent vein with open collaterals seldom produces edema, but the obstruction of main venous channels and their collaterals without ligation usually results in edema. This further justifies the removal of

bland thrombi *early* while the process is still limited to the femoral or leg veins.

OPERATIVE TECHNIQUE

Femoral Vein Exploration.—In the majority of instances 1 per cent procaine hydrochloride infiltration locally is used. When there is no contra-indication in patients with marked vasospasm, low spinal anesthesia is chosen. A longitudinal incision is made from the crease of the groin distalward over the course of the pulsating femoral artery and carried down through the subcutaneous fat and fascia. The saphenous vein is usually encountered and if it is normal is retracted medially, together with the subcutaneous layers, to expose the femoral vessels (Fig. 1). If the saphenous vein is thrombosed, it is ligated and divided above the proximal extension of the thrombus. The femoral artery overlies the lateral portion of the femoral vein. The femoral sheath is incised along the medial aspect of the femoral artery, which is then freed from the femoral vein and gently retracted laterally about 4 centimeters inferior to the inguinal ligament.

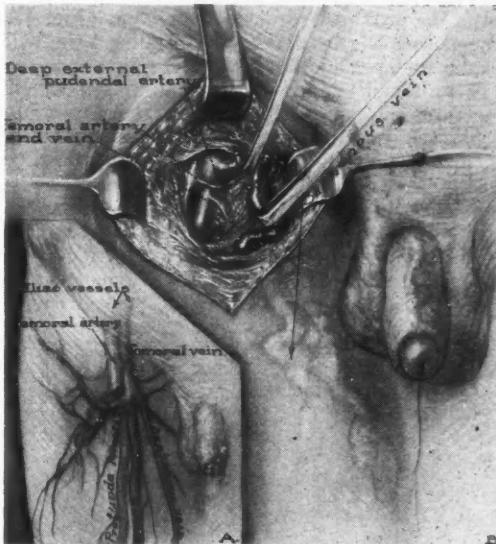


Fig. 1. Incision in thigh showing approach to femoral vein.

The deep femoral vein enters the posterior lateral aspect of the superficial femoral vein (Fig. 2). The pathological findings, if any, are then observed. The superficial femoral vein is freed for a distance of 2 to 2.5 centimeters distally by sharp and gentle dissection. Two double strands of number 40 cotton are passed about this freed segment of vein and are held by hemostats at the proximal and distal ends. A transverse incision is then made through the anterior wall of the vein in the central portion of the freed segment. If no thrombus is present at this level, bleeding will be profuse from above and below. If a thrombus is present it will partially extrude itself. Suction is then applied to the thrombus

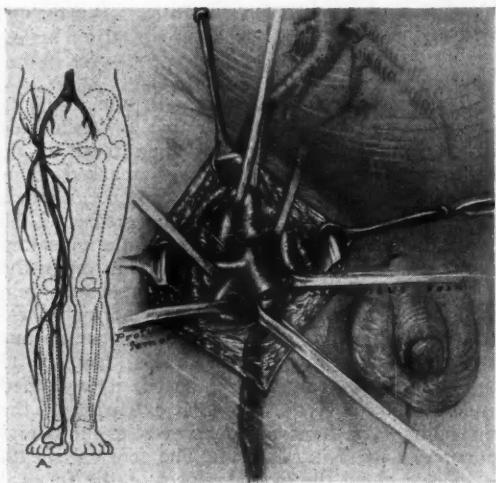


Fig. 2. The dissection is carried further and the thrombus is exposed by an incision made in the superficial femoral vein.

through an angulated glass tube, evacuating it from the proximal segment of the vein (Fig. 3). When this has been accomplished the vein will readily collapse and free back bleeding will occur. The proximal ligature is then tied. As much of the thrombus as possible is aspirated from the distal segment of the vein. This is sometimes facilitated by applying suction through a fairly small urethral catheter, which often can be passed farther distally in the vein than the angulated glass tube. Clearing of the distal segment is important in opening numerous tributaries, thus increasing the collateral circulation and decreasing the subsequent edema of the extremity.

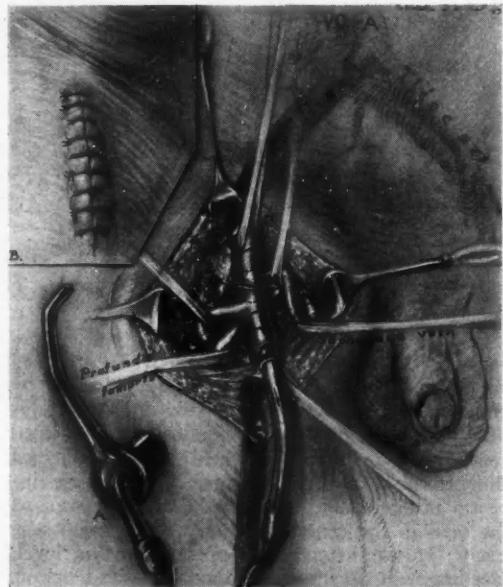


Fig. 3. Aspiration of the thrombus from the superficial femoral vein.

The distal ligature is then tied, the vein completely severed, and each end transfixated with a double number 40 cotton suture distal to the ligature.

This same procedure is carried out on the superficial femoral vein, when a noninflammatory thrombus is present within it or as high as the proximal portion of the common femoral vein. However, if in addition to involvement of the superficial femoral vein, there is a thrombus within the deep femoral vein, the common femoral vein is ligated. In the common femoral vein anatomical variations are exceedingly common and several small tributaries are given off just proximal to its junction with the deep and superficial femoral veins. It is necessary here to use careful, gentle technique to avoid damage to these tributaries, which may serve as important collateral channels after the ligation, and bleeding from which may obscure the field and make the dissection more difficult. The common femoral vein is freed distal to its junction with the saphe-

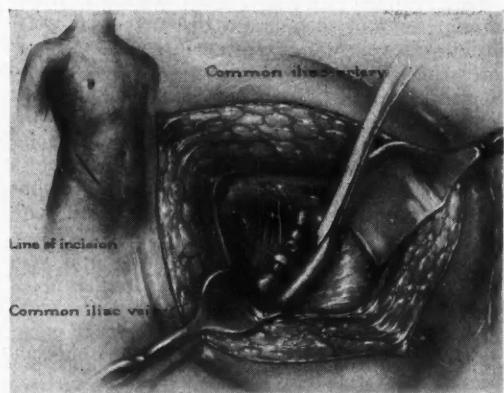


Fig. 4. Incision and dissection for extraperitoneal ligation of common iliac vein.

nous vein and traction ligatures are placed about the freed segment which is then opened. The thrombus is aspirated from each segment, and ligation, division and transfixion are carried out as previously described. The wound is irrigated with isotonic solution of sodium chloride and closed in layers without drainage, using interrupted sutures of fine cotton.

Iliac Vein Exploration.—In patients with a relatively long-standing process and in whom a clinical diagnosis of ilial thrombophlebitis has been made, an extraperitoneal approach to the iliac veins is carried out. If exploration of the femoral region reveals an adherent thrombotic process which extends proximal to the common femoral vein, that wound is closed and the common iliac vein exposed through the approach to be described. Under low spinal or inhalation anesthesia an oblique incision is made parallel with, and just above and medial to, the inguinal ligament (Fig. 4). The aponeurosis of the external oblique muscle is divided in line with the incision, and the fibers of the internal oblique and transversalis muscles are spread to allow entry

to the extraperitoneal space. The peritoneum is mobilized superiorly and medially to expose the external and common iliac veins. Simple ligation of the common iliac vein above the proximal extension of the thrombus is carried out. Ligation of the common iliac is preferable to division of the external iliac vein because of the better collateral circulation provided through the hypogastric vein. The common iliac artery is mobilized and retracted slightly medially on the right side and laterally, when exploration is done on the left side. A small segment of the common iliac is freed posteriorly and medially until a curved clamp can be inserted posterior to it at a point proximal to the extension of the thrombus. A double ligature of double number 40 cotton is then placed about it and tied to completely occlude the vein. Obviously the dissection and ligation must be done with extreme care to avoid tearing of the vein. The wound is closed in layers without drainage with interrupted sutures of fine cotton.

If it is necessary to ligate the inferior vena cava because of extensive bilateral thrombosis involving both common iliac veins, or extending well into the vena cava from one side, a similar approach is used on the right side, the incision being placed somewhat higher than for ligation of the common iliac vein.

When a diagnosis of phlebothrombosis or thrombophlebitis is made, a bilateral ligation is carried out at the appropriate level, even though definite clinical signs may exist in only one extremity. We have occasionally been amazed to find a rather far advanced thrombosis in the femoral vein of a clinically normal extremity. This procedure is carried out in patients who have had pulmonary embolism, even though there may be no evidence of thrombosis of the lower extremities.

Postoperatively these patients are allowed out of bed immediately if their primary disease does

not contra-indicate ambulation. Constant support is provided in the form of elastic bandages from the toes to the knee and these are worn until edema no longer develops as a result of activity. Anticoagulant therapy is used only in the occasional patient in whom pulmonary embolism recurs after a bilateral ligation. If persistent vasospasm is present, paravertebral sympathetic injections of procaine are given at intervals until the vasospasm is relieved.

SUMMARY

1. Ligation or interruption of the iliofemoral veins is a life-saving procedure in patients who have had pulmonary embolism.
2. This should be carried out early in order to prevent extension of the thrombus into the pelvic veins with resultant phlegmasia alba dolens and persistent edema.
3. Vein ligation should not be postponed until the patient has had multiple pulmonary infarctions.
4. Bilateral, rather than unilateral, ligation is preferable because the pathological process may be symmetrical even though there are no clinical findings in one extremity.
5. In patients with adherent vein thrombosis (thrombophlebitis) ligation should be done proximal to the thrombus.
6. Edema is no more marked in the ligated than the unligated cases and is usually lessened if ligation is carried out early.

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ARMY PHYSICAL RECORDS POINT TO DANGER OF OVERWEIGHT

Overweight, emotional elevations of the blood pressure and acceleration of the heart beat are the forerunners of serious illness, according to four investigators writing in the July 20 issue of *The Journal of the American Medical Association*.

The investigators, Robert L. Levy, M.D., of New York, Paul D. White, M.D., of Boston, William D. Stroud, M.D., of Philadelphia and Brig. Gen. Charles C. Hillman, United States Army, studied the medical records of 22,741 army officers which contained the results of annual physical examinations made between January, 1924, and December, 1941.

The authors predict from their study that overweight

associated with the temporary elevations of blood pressure and rapid heart beat will lead eventually to the development of high blood pressure and diseases involving the heart, blood vessels and kidneys.

A group of men who during the period of study showed none of the predisposing factors were observed in comparison. The study reveals that the later development of high blood pressure was 12 times as great in the overweight group as in the comparison group. In the case of retirement from duty because of diseases involving the heart, blood vessels and kidneys, the rate was four times as great.



The Coccidioidin Skin Test In The Panama Canal Zone

RESULTS OF A BRIEF SURVEY IN TUBERCULOUS AND NON-TUBERCULOUS PATIENTS*

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NO previous effort has been made to determine the prevalence of infection in man with *Coccidioides immitis* in the Panama Canal Zone by means of the coccidioidin skin test. With the exception of one clinical case of pulmonary coccidioides infection,¹ probably imported, there is no evidence that the fungus occurs in this region. Tuberculosis, on the other hand, has been the principal cause of death from disease in nearby Panama City. The annual mortality rates, 1937-1941, averaged 1.51 per 1,000.² This situation invited investigation in the light of the opinions expressed by some that this test may give false or cross reactions in patients with active tuberculosis (see Strong³ for summary of literature). Although this work was interrupted before a large series of patients could be tested, the results obtained seemed of sufficient interest to justify this brief report.

MATERIAL AND METHODS

A total of 154 colored patients from the medical wards of Gorgas Hospital, Ancon, Canal Zone, were skin tested. Each was required to have no history of such allergic conditions and diseases as asthma and hay fever and to have never traveled to the United States. Fifty-one were individuals with laboratory and roentgenologic proof of active pulmonary tuberculosis. One hundred and three were patients with various medical illnesses selected with regard to freedom from tuberculosis. Thorough clinical examinations were performed in all cases for this purpose, laboratory and roentgenologic procedures were employed in all known tuberculosis contacts and wherever suggestive physical findings were noted.

The antigen used in this study was prepared by Dr. J. F. Kessel, Chief Microbiologist, the Los Angeles County General Hospital, and shipped via air mail. Its potency on arrival was confirmed on a patient known to have reacted to the antigen when tested previously elsewhere. Except when the tests were being performed, this material was kept under refrigeration. In all instances a 1:100 dilution of coccidioidin antigen in merthiolated saline (1:10,000) was used. After cleansing the flexor surfaces of the forearms, 0.1 cc. of diluted antigen was given intradermally

in the right forearm and a control injection of merthiolated saline in the left. Reactions were read at the end of 48 hours and the standards were those generally accepted for the tuberculin skin test.

New needles and syringes were obtained for this study. After use they were washed in distilled water, 70 per cent alcohol, and packed separately in labeled glass tubes in order to prevent interchange of control and test equipment. The cotton-plugged tubes were autoclaved prior to use.

CLINICAL DATA

The majority of these patients came from urban centers, especially Panama City and Colon. Occupational categories were few: housewife, maid, laborer, clerk; two were seamen.

Among the patients with active tuberculosis, 40 were males, 11 were females; the heterogeneous group was composed of 81 males, 22 females.

The predominant races were Panamanian mestizos, of mixed white and Indian ancestry, and West Indian Negroes; Chinese, South and Central Americans were also represented. The relationship of race to tuberculosis was as follows:

	Non-	Tuberculous	tuberculous
Panamanian mestizos.....	25	33	
West Indian Negroes.....	14	64	
Others	12	6	

The age distribution of the groups under consideration is shown in the following lists:

	Non-	Tuberculous	tuberculous
11 - 20 years	8	13	
21 - 30 years	15	20	
31 - 40 years	11	17	
41 - 50 years	6	12	
51 - 60 years	5	28	
61 - 70 years	6	7	
71 - 80 years		5	
81 - 90 years		1	

RESULTS

With one exception, every test was negative. In eight of the non-tuberculous patients minor reactions varying from slight erythema to recognizable induration were noted. Patients with active tuberculosis showed no response whatever to the antigen; eight of them had previously been tested with tuberculin with positive reactions. (Most

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had moderately or far advanced disease, making it unwise to perform routine tuberculin tests.)

The single individual giving a positive coccidioidin skin test reaction was a 60-year-old Barbadian male, a resident of Panama City, who had entered Gorgas Hospital because of coronary heart disease with myocardial infarction and generalized arteriosclerosis. There was no evidence of tuberculosis after clinical, laboratory and roentgenologic studies; the tuberculin reaction was one-plus positive. His reaction to coccidioidin consisted of a papule measuring 5.0 millimeters and an areola of erythema 10.0 millimeters in diameter. He was recalled four months after the original test for a second injection of coccidioidin. The reaction was again positive.

COMMENT

The number of tests performed in this study is too small to warrant definite conclusions. These results are, however, compatible with the apparent absence of autochthonous coccidioidal disease in this region. Negative coccidioidin tests usually exclude the possibility of infection.⁴

The single positive test probably tends to assume too great an importance because of the

small total number of observations in this series. No explanation for this exception is forthcoming. Positive coccidioidin reactions have been reported previously in patients with no known infection with *C. immitis*.⁵

In agreement with the opinions of other investigators^{6,7} evidence suggesting false or cross reactions to coccidioidin in patients with active pulmonary tuberculosis was not found.

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POLIOMYELITIS IN SAN FRANCISCO

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IN the period from 1930 to 1945, there have been four intervals in which the incidence of poliomyelitis has reached an epidemic stage—1930, 1934, 1943 and 1945. Prior to 1930 increased incidence had occurred with rather definite regularity at intervals of from two to two and one-half years. After 1930, the intervals between epidemics were longer and more irregular.

Both the 1930 and 1934 epidemics in San Francisco have been reviewed at length by this department.^{1,2} Discussions on the possibility of the spread of poliomyelitis as a result of direct personal contact and on the use of convalescent serum are also in publication.^{3,4} So far as 1945 is concerned there were quarantined for a period of two weeks, 110 contacts of diagnosed cases, 53 of which were in the age groups 0-6 years; 37 in the age groups 6-12 years and 20 in the age group 12-18 years. Moreover, mothers were given permission to do the necessary shopping for family supplies including food, and wage earners were allowed to work provided they did not work with food or children. In this quarantine group (110) and in all others so involved no case of poliomyelitis developed.

In this report which has been extended to cover the elevated incidence of 1943 and 1945, certain comparative data are presented for further analysis.

In Table 1 an attempt has been made to present significant comparative detail for each of the four years above mentioned. Attention is invited to certain similarities and differences occurring in these figures. In each of the first three years, the progress of the reported local incidence followed approximately the same pattern—a rather abrupt beginning rise continuing to a peak, and then a sudden decline and disappearance of reported cases. The record for 1945 is one of fluctuating reports. The first two epidemics were of much shorter duration than either of the last two.

The number of non-local cases shows a definite increase through the four epidemics reaching a high level in 1945. In 1930 the non-local cases were 14 per cent of all cases reported, in 1934, 18 per cent. In 1943 they were 55 per cent of the total and by December 1, 1945, the figure had reached 60 per cent. The probabilities are either that improved methods for hospital care had been established in San Francisco or that the statewide simultaneous outbreaks in 1943 and 1945 occurred in areas in closer proximity or in those without adequate hospital facilities. Table 7 indicates the areas from which non-local cases were received in San Francisco. The percentages of non-residents in the total deaths from poliomyelitis also show increases in the same years although the figure for 1943 is higher than that for 1945.

A tabulation on onset dates, Table 2, tends to support the opinion arrived at in Table 1, that

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there is apparently no fixed or predictable seasonal incidence in these periods of so-called epidemics.

TABLE 1.—*Poliomyelitis*

	1930			1934		
	Cases Local	Cases Non-Local	Deaths	Cases Local	Cases Non-Local	Deaths
January	1	0	0	1	0	1
February	0	0	0	2	0	0
March	1	0	0	0	0	1
April	0	0	0	1	1	0
May	0	0	0	3	1	2
June	3	0	1	74	12	8
July	7	4	0	26	4	1
August	24	10	6	13	4	1
September	68	3	7	2	0	0
October	81	10	7	0	0	0
November	29	6	2	0	3	1
December	16	5	4	0	2	0
Totals	230	38	*27	122	27	**15
*Includes 6 non-residents 22%	**Includes 5 non-residents 35%					
Period of epidemic—August-December				June-August		
Peak—October				June	17.7	
Morbidity rate /100,000	35.91					
Mortality rate /100,000						
on total deaths	4.2				2.2	
on resident deaths only	3.3				1.5	
1943				1945		
January	0	1	0	3	1	0
February	1	0	0	0	1	0
March	1	0	0	0	1	0
April	0	0	0	1	0	0
May	5	2	1	0	1	0
June	7	15	4	5	13	0
July	12	33	3	10	24	0
August	28	37	2	9	19	3
September	20	32	1	18	19	2
October	36	23	2	13	25	3
November	28	20	0	23	21	0
December	4	10	0			
Totals	142	173	*13	82	125	**8
*Includes 11 non-residents 84%	**Includes 5 non-residents 62 1/2%					
Period of epidemic—June-November				June-November to date November		
Peak—October				June	10.8	
Morbidity rate /100,000	18.3					
Mortality rate /100,000						
on total deaths	1.7				1.1	
on resident deaths only	0.3				0.5	

TABLE 2.—*Local Cases—By Onset Dates*

	1930	1934	1943	1945
January	0	1	0	2
February	1	1	1	0
March	0	1	0	0
April	0	2	1	2
May	2	12	6	4
June	3	79	6	4
July	10	26	22	9
August	27	0	25	8
September	72	0	21	21
October	78	0	37	16
November	25	0	24	16
December	12	0	1	0

TABLE 3

	Mean Temperatures			1945	1930	Rainfall		
	1930	1934	1943			1934	1943	1945
June		61.0	57.4	61.3		0.68	0.13	0.01
July		60.0	59.0	64.1		0.01		
August	61.5	60.9	59.8	64.1				
September	62.4		63.4	69.2	0.10		0.02	0.04
October	63.2		61.2	67.5	0.89		0.74	1.95
November	58.0		59.0	61.4	1.56		0.80	3.24
December	52.3				0.98			

TABLE 4.—*Sex*

	1930			1934			1943			1945		
	M	F	T	M	F	T	M	F	T	M	F	T
Local cases	145	85	230	65	57	122	73	69	142	39	43	82
Non-local cases	24	14	38	13	14	27	102	71	173	69	56	125
Deaths	14	13	27	8	7	15	6	7	13	5	3	8
Rates females to males in local cases	1:1.7			1:1.4			1:1.06			1:0.9		

In an attempt to associate climatic conditions with increased incidence of poliomyelitis, mean temperatures and total rainfall in inches for San Francisco during those months in which epidemics persisted are shown in Table 3. A study of this tabulation discloses that in each year the peak of cases both by date of reporting and date of onset occurred within a period when the annual maximum mean temperature had been reached. Extreme maximum temperatures were found on October 6, 1930 (92 degrees) the month in which the epidemic of that year had reached its peak, again on June 29, 1934 (95 degrees) a peak month in that epidemic, and on September 21, 1943 (96 degrees) a trifle earlier than the peak of the epidemic. The year 1945 did not have at any time a period of extreme maximum temperatures. However, the highest temperature for the year was reached in June (87 degrees) another high temperature of 85 degrees in September, 83 degrees in October and 82 degrees in November, all months in which cases of poliomyelitis beyond a normal expectancy were reported. It is further noted that the monthly mean temperatures in 1945 were considerably higher than for the corresponding months in the other years. Monthly precipitation may not be an important factor. The table indicates only the anticipated seasonal increases in rainfall and these do not coincide significantly with increases in the incidence of poliomyelitis.

A slight change in sex distribution is indicated in Table 4. In the earlier epidemics the males were considerably in excess of the females, the ratio gradually shifting until in 1945 the reverse is true.

The median age in local cases increased in the 15 years over which these epidemics occurred. The percentage of adults in local groups ranged from 19 to 26, the highest and lowest percentages occurring in 1943 and 1945, respectively (Table 5). There is somewhat of interest in the tabulation of cases hospitalized (Table 6). In the epidemic of 1930, cases were distributed for care among many of the local hospitals. By 1945, the entire burden had fallen upon Children's Hospital and the Isolation Division of the San Francisco Hospital for both local and non-local cases.

TABLE 5.—Age

	1930		1934	
	Local	Non-Local	Local	Non-Local
Under 1 year	2	0	1	0
1 - 4 years	47	5	13	2
5 - 9 years	84	12	34	7
10 - 14 years	37	9	36	5
15 - 19 years	9	5	13	4
Adult	51	7	25	9
Adult group in local cases	22% of total		20% of total	
Median age in local cases	8 years		11 years	
1943				
	Local	Non-Local	1945-Dec. 1	
Under 1 year	8	2	1	1
1 - 4 years	19	35	12	34
5 - 9 years	45	37	25	32
10 - 14 years	25	40	12	19
15 - 19 years	14	21	16	6
Adult	37	28	16	33
Adult group in local cases	26% of total		19% of total	
Median age in local cases	10 years		11 years	

Most of the non-local cases in the epidemics of 1930 and 1934 came from San Mateo County. In 1943, Solano, Santa Clara, Marin and Contra Costa as well as San Mateo were sending patients into local hospitals. In the current series of cases, Marin and Solano counties alone are responsible for nearly 50 per cent of the non-local cases hospitalized locally. This obvious and general geographic concentration may have many humanitarian and excellent clinical aspects but may present some local epidemiologic hazards, even under the best controlled conditions for handling virus diseases of this type.

In the first eleven months of 1945, there were four local families in which multiple cases occurred, the onset being usually of only a few days intervening from the original cases. Of non-local families seven had more than one case. In three areas in the city there has been a definite concentration of cases, of no more, however, than three cases to one ordinary city block. Preliminary sanitary investigation of districts in which several cases of poliomyelitis occurred during

1945 indicated that the fly problem was non-existent or slight and apparently unimportant; there was not any mosquito breeding; and in the matter of sewage, in two districts there was sewage overflow of the manholes directly in front of the homes in which cases occurred. This, however, was immediately corrected.

Of the cases in this series, 21 were clinically considered non-paralytic poliomyelitis; 13 cases recovered without residual paralysis and 32 cases had some form of residual paralysis. Data as to the remaining group of cases are still being sought.

TABLE 7.—Counties of Residence

Counties	Non-Local Cases			To Dec. 1, 1945
	1930	1934	1943	
Alameda		5	7	10
Butte			9	4
Calaveras			1	
Colusa		1	1	
Contra Costa			16	4
Glenn			1	
Humboldt		1		
Lake		3		
Lassen			1	
Los Angeles			2	
Marin	2	4	16	39
Mariposa			1	
Merced		1		1
Monterey		1		1
Napa	1	1	3	6
Nevada				1
Placer	1			
Sacramento		4		1
San Joaquin			1	
San Mateo	12	6	13	4
Santa Clara	2	2	19	3
Santa Cruz	1		1	2
Shasta		7		
Siskiyou			2	1
Solano		1	22	28
Sonoma	2	2	3	
Stanislaus			5	3
Sutter			2	5
Tuolumne			1	
Yolo			4	1
Yuba	1	1	4	6
Out of state				
Local address with non-local infection	9	1	24	6

TABLE 6.—Hospitalization

	1930		1934		1943		1945-Dec. 1	
	Local	Non-Local	Local	Non-Local	Local	Non-Local	Local	Non-Local
At home	51	5	2	0	15	2	0	0
In Hospitals	179	33	111	27	127	169	81	123
No statement		9			2	1	2	
<i>Hospitals</i>								
Children's	87	23	33	13	55	129	42	93
Isolation	47	2	46	5	61	28	38	26
Dante	6		1					
Franklin	2							
French	4		4	2				
Letterman	4			1	1	8	1	4
Mary's Help			1					
Mt. Zion	4	1	2					
St. Francis	1		2					
St. Joseph's	1							
St. Luke's	4	1	2					
St. Mary's	5		4				1	
Shriners'					1			
Southern Pacific						1		
Stanford	12	4	9	1	2	1		
U.C.	2	2	5	1	3	1		
U. S. Marine					1		1	
Outside hospitals						4		

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California Public Health Laboratories And Their Services to Physicians*

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THE laboratory of the California State Department of Public Health is now 41 years old. It was established by legislative act on July 1, 1905. During the first three years of its existence diagnostic tests for diphtheria constituted the major portion of the work done. In fact, 69 per cent of the 7,254 examinations made in the 1906-1908 biennium were for diphtheria, and most of the remainder were for typhoid fever. In 1908 diagnostic services for gonorrhea, tuberculosis and rabies were added. In 1909 a branch laboratory was established in Los Angeles, a second branch in Fresno in 1910 and a third in Sacramento in 1912.

In 1912 the State Board of Public Health ruled that routine examination service privileges of the State laboratory should be limited to cities having populations of 25,000 or less. Thereby was established the basic policy of developing local public health laboratory facilities. As local laboratories were developed in Los Angeles, Fresno and Sacramento, the State laboratory closed its branch laboratories and began entering the field of inspection and approval of local public health laboratories. This inspection and approval was formally authorized by law in 1927.

Examination and certification of laboratory technicians was begun in 1930 upon authorization by the State Board of Public Health. Examining and licensing of clinical laboratory technicians and certification of public health laboratory technicians was authorized by legislative act in 1937.

Throughout the period from 1905 to the present there has been a gradual expansion of the laboratory services provided to physicians of the State by the State and local public health laboratories. This expansion has been both in volume of work done and in the diversity of the services offered.

There are now 32 local public health laboratories plus seven branches of local public health laboratories in addition to the State laboratory that are providing services designed to protect the health of the people of California.

During 1945 this total laboratory system reported 1,297,774 examinations in a wide variety of fields.

The services of the State laboratory and the local public health laboratories are closely integrated, so closely, in fact, that from a practical standpoint there is in reality one statewide labora-

tory system. This despite the fact that each local laboratory is under the administrative supervision of the respective local health officer.

The close correlation of services is brought about in several ways. Probably the most important single factor is the unique spirit of cooperation existing between the personnel in the State and local laboratories. A considerable number of the technical personnel in the local laboratories have actually worked in the State laboratory and are consequently familiar with State laboratory policies and procedures.

A second factor is the consultative service provided by the State laboratory, both by direct visits to local departments and by mail and telephonic communications.

The legal authority upon which this coordinated service rests is contained in one brief section (Section 1002) of the Health and Safety Code which provides that local laboratories shall employ only technical personnel and use only equipment approved by the State Department of Public Health. Under its general regulatory powers and the provisions of this section of the law, the State Board of Public Health has adopted regulations that spell out the relationship in more specific terms. These regulations may be briefly summarized as follows:

"Section 1: Each local health department shall have available the services of an official public health laboratory. The laboratory of the State Department of Public Health is hereby designated as the official laboratory for all local health department jurisdictions not covered by local laboratory service."

How the public health laboratory services are distributed geographically between the State and local laboratories is shown in Figure 1. The State laboratory provides direct service in 36 counties comprising a population of 1,369,320 or 14.8 per cent of the total State population.

Thirty-two local public health laboratories provide the routine services throughout the area represented by the unshaded portion of the map. The completeness of this local service varies to some extent. In some counties (as Solano County) and some cities (as Berkeley and Richmond) the State laboratory still does the serology. In other instances the rabies examinations and various other procedures that may be considered routine are done in the State laboratory. Just how extensive this interchange of services becomes will be evident from data presented later in this paper.

There are a number of special procedures that are offered only by the State laboratory such as

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diagnostic tests for virus diseases, phage typing of *E. typhosa*, *Salmonella* typing, etc. These special services will be enumerated and discussed in more detail in later paragraphs.

Section 2 of the regulations requires that local laboratories have certificates of approval.

Section 3 requires periodic reports from laboratories, including monthly statistical reports of tests performed and reports of any personnel changes.

Section 4 enumerates in general terms minimum requirements for approval, including ade-

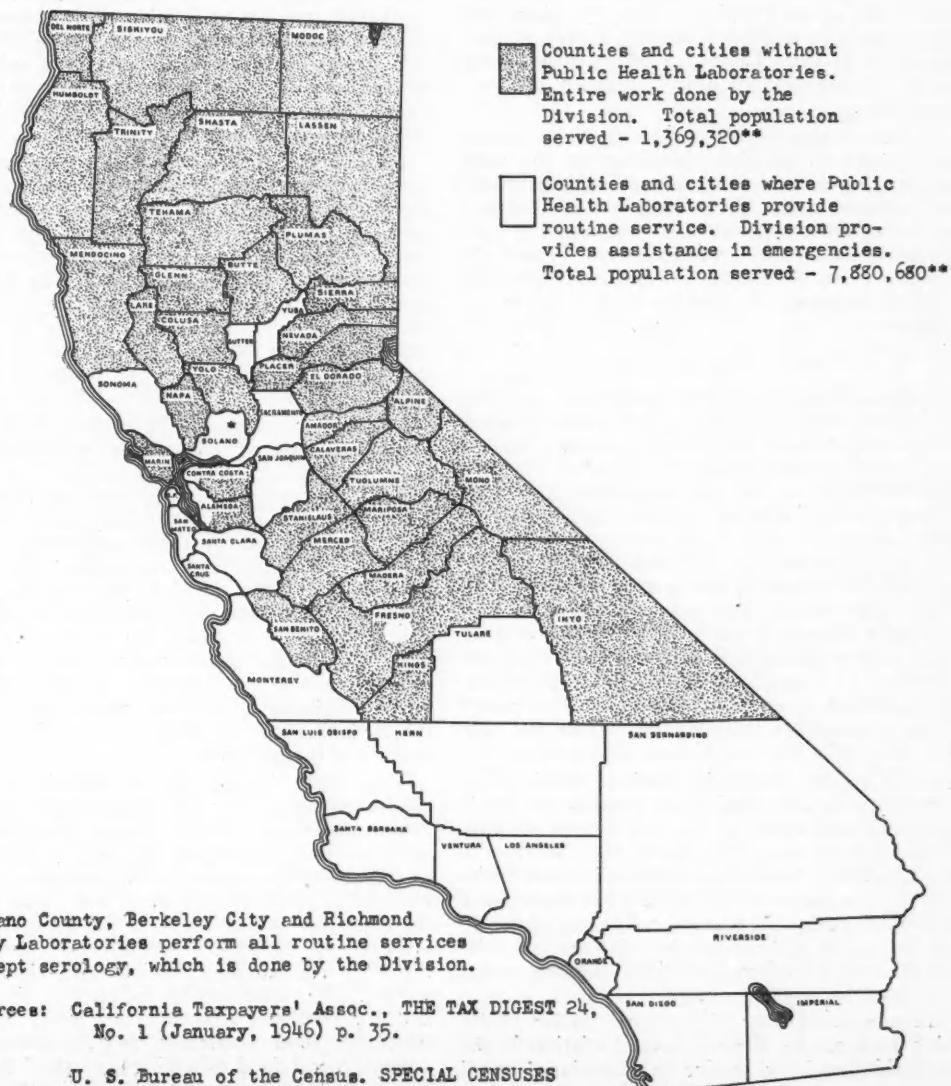
quate facilities and equipment and the use of approved test procedures, maintenance of adequate records, and employment of certified personnel.

Section 5 requires positive cultures from all typhoid carriers be sent to the State laboratory and that the State laboratory be notified of any specimens received for diagnosis of plague.

Section 6 requires that technical personnel be examined and certified by the State Department of Public Health and establishes minimum qualifications of candidates admitted to the certifying examinations.

FIGURE 1.

AREAS SERVICED BY THE STATE AND LOCAL PUBLIC HEALTH LABORATORIES IN 1945



Section 7 provides for apprenticeship training in approved public health laboratories.

Section 8 requires that certain specimens be sent to an official public health laboratory but provides that they may in addition be tested in other laboratories.

Section 9 provides for inspection of local laboratories by representatives of the State laboratory.

Section 10 permits local health departments to contract with approved private laboratories for service.

In addition to the enforcement of the Regulations, the State laboratory provides a consultative service to local laboratories. In fact, as already suggested, the enforcement of the regulations is through the avenues of a consultative and advisory service. This service is by direct visits, by telephonic or postal communications. Also, personnel are actually assigned from the State laboratory staff to work for varying periods of time in local laboratories to assist in emergencies and in the introduction of new techniques and procedures.

It should also be noted that the State laboratory produces and distributes most of the diagnostic antigens and antisera used in local public health laboratories. These include antigens used in serologic tests for syphilis, agglutinating antigens and antisera for enteric diseases, brucellosis, tularemia, etc. This helps to insure uniformity of tests throughout the public health laboratory system.

HOW SERVICE IS PROVIDED

Practically all specimens coming into the State laboratory come either by mail or other common carrier. The State laboratory provides various types of mailing containers to physicians throughout the area served. In many instances drug stores in the rural areas serve as repositories for these containers as an added service to the physicians of their community. In the majority of instances the containers are sent to physicians directly upon request. An account is maintained in the State laboratory for each physician or other repository receiving containers. We are currently carrying 1,175 such accounts. In other words, there are 1,175 repositories for State laboratory mailing containers scattered throughout the area represented by the shaded area of the map.

As with all diagnostic services provided by public health laboratories, no charges are made for these examinations. The only cost to the physician is the postage for mailing the specimen to the laboratory. Reports are routinely rendered by mail unless telephonic or telegraphic reports are requested, except in case of rabies, in which all positive reports are made by telephone or telegraph, and in other conditions deemed emergencies.

In the areas covered by local public health laboratory service there is some variation in the accessibility of the service to physicians. In all instances specimens are accepted if delivered to

the health department or laboratory. In some of the larger centers, as Los Angeles City, there are multiple repositories throughout the city where specimens may be left and from which daily collections are made. Through the system of district health offices the same general plan applies in Los Angeles County. In the latter department mailing containers are also provided so physicians may mail the specimens into the laboratory.

A mailing service is provided for blood specimens for serology by the San Francisco Health Department and by a number of other local health departments. In other words, health departments attempt to make the service readily available to physicians.

TESTS PERFORMED IN 1945

Since each local public health laboratory reports to the State at monthly intervals the tests made, it is possible to determine the types of tests performed and the total volume of work done in each public health laboratory in the State. This data for 1945, giving total number of each type of test done in all public health laboratories and the per cent of the total done in the State laboratory is shown in Table 1.

By this type of tabulation it is possible to illustrate objectively the inter-relationship as a working organization of the State and local laboratories. It should be recalled that the State laboratory provides direct service for approximately 15 per cent of the State population. If this figure is kept in mind as the respective test procedures are noted the test procedures in which the State laboratory provides overlapping consultative or special services in local laboratory jurisdictions will become evident.

In Table 1 several of the tests performed are listed by disease. It will be noted 6019 agglutination tests for brucellosis were performed, of which 26.3 per cent were done in the State laboratory. While the State laboratory provides the antigens used for these agglutination tests, most of the actual tests are performed in local laboratories. Four hundred twenty specimens were examined for coccidiomycosis with 25 per cent being done in the State laboratory. These tests include both cultures and animal inoculation, for the most part on sputum specimens. In the case of diphtheria, it will be noted that most of the Kellogg tests for determination of immunity were done by the State.

This, then, is one service that is provided almost exclusively by the State laboratory. Also few of the rural laboratories are equipped to do virulence tests accounting for the relative excess of this procedure by the State. The specimens are received in the local laboratory and forwarded to the State for testing, as it is the general policy not to accept such specimens directly from physicians in communities having local laboratory service. The same applies to amoebic dysentery and for botulism. On the other hand, in other types of food poisoning (e.g., salmonellosis, staphylococcal food poisoning), most of the outbreaks that are investigated occur in the larger

centers where local laboratory service is available so the State laboratory does a proportionately small percentage of the tests.

The larger venereal disease clinics have their own local laboratories that do the smears and cultures for gonorrhea at the clinic. The State laboratory provides no gonococcal culture service but does provide a consultative service on culture techniques.

Most of the meningococcal meningitis tests are performed at the local level. The State does a relatively high percentage of the paratyphoid agglutinations due to having established a *Salmonella* typing service. On the other hand, all the pneumococcal tests are done locally.

TABLE 1.—Total Reported Laboratory Tests Performed By Public Health Laboratories in California in 1945

Tests Performed	Number of Tests	% Done by State
Bacteriology:		
Brucellosis—Agglutinations	6019	26.3
Coccidioidomycosis—Cultures, Anl. Inoc.	420	25.0
Diphtheria—Kellogg Tests	2,202	89.9
Throat Cultures	56,310	7.7
Virulence Tests	505	38.4
Dysentery—Amoebic, Feces	1,213	33.4
Bacillary, Feces	1,789	1.4
Agglutinations	137	10.2
Food Poisoning—Botulism	123	46.7
Salmonella	114	13.2
Staphylococcal	581	3.3
Miscellaneous	489	3.1
Gonorrhea—Smears	86,058	6.2
Cultures	57,047	
Leprosy Examinations	22	9.1
Malaria—Smears	204	20.6
Meningococcal Mening.—Spinal Flids.	422	.5
Nose and Throat Cultures	28	
Parasites—Intestinal	1,664	5.4
Paratyphoid—Cultures	3,923	1.9
Agglutinations	6,489	48.0
Pneumococci—Blood Cultures	21	..
Sputum Typing	42	
Rabies—Smears	3,716	7.8
Animal Inoculations	193	84.4
Staphylococci—Throat Cultures	1,705	.1
Streptococci—Throat Cultures	5,952	..
Spinal Fluid Cultures	1,502	
Tuberculosis—Smears	23,236	17.5
Cultures	2,682	23.9
Animal Inoc.	1,479	53.2
Tularemia—Agglutinations	647	55.7
Typhoid—Feces and Urine	4,388	42.6
Blood Cultures	671	75.2
Agglutinations	3,201	48.3
Typhus and R.M.S.F.—Weil-Felix	575	27.8
Vincent's Angina—Slides	2,163	..
Miscellaneous (Pertussis, Fungus Examinations, Weil's Disease, Skin Tests, Anthrax, Trichinosis, Etc.)	1,052	48.7
Serology:		
Blood		
Kahn	258,461	17.8
Wassermann	201,841	24.1
Kline	516,685	46.3
Mazzini	25,318	..
Eagle	47,222	
Spinal Fluids	17,093	33.3
Colloidal Gold	4,644	9.6
Clinical Tests	100,354	..
Tests on Milk and Milk Products	190,554	..
Water Samples:		
Bacteriological Examination	23,120	12.5
Chemical Examination	5,503	75.1
Miscellaneous Examinations	151	..
Miscellaneous Tests (Glassware, Rinse Samples, Etc.)	7,052	..

In rabies the majority of the smear examinations are made locally but animal inoculations are done at the State level as a consultative or special service to local health departments.

Practically all staphylococcal and streptococcal testing is done at the local level.

Continuing with Table 1, Public Health Lab-

oratories provide smear, culture and animal inoculation service for tuberculosis. The latter is again a special service the State laboratory provides for rural local laboratories. The same applies for tularemia.

The typhoid figures for 1945 are somewhat distorted by an outbreak in an area in which the State provides the direct service and by special studies the State was conducting in a mental institution.

Under the miscellaneous item are noted several other procedures offered by public health laboratories such as cough plate tests for pertussis, examinations for fungi, agglutination tests for Weil's disease, occasional examinations for anthrax, plague, trichinosis and other of the less common diseases. The tests noted in this table illustrate the wide variety of bacteriological test procedures on communicable diseases provided to physicians and health officers by public health laboratories.

Additional services routinely offered are also listed. The relatively large volume of serology in the State laboratory is due to the Selective Service and other testing in connection with the war which has been done at the State level. The State laboratory also does the serology testing for a number of State institutions.

It will be noted that all clinical tests are grouped together and that they are done exclusively in local laboratories. These are routine urine analyses, blood counts, sedimentation rates, etc., done in connection with the operation of local public health clinics. Such specimens are not accepted from private patients either at the State or local level.

Since at the State level the State Department of Agriculture is responsible for enforcement of laws pertaining to milk and milk products, the State Department of Public Health laboratory does not participate in this field. However, such testing is done in the public health laboratory at the local level.

The bacteriological testing of water samples is a routine procedure in all public health laboratories. However, only a limited number are equipped for chemical tests on water, accounting for the diversion of this work to the State Laboratory.

A number of miscellaneous examinations on water primarily of sanitary significance are also done in local laboratories.

The above listing provides a resume of the routine services provided by the State and local public health laboratories. In addition there are a number of services provided exclusively by the State laboratory that are of interest in rounding out the picture.

First might be mentioned the services of the Virus Laboratory. In 1939, through grants from the Rockefeller Foundation, the State Department of Public Health established a virus research laboratory for the study of influenza. Since then the scope of the research work has gradually expanded to include infectious jaundice, atypical pneumonia, diseases of the psittacosis

group and typhus fever. A second special grant from the Rockefeller Foundation in 1942 made possible the establishment of a virus diagnostic unit. A year ago the research and diagnostic services were amalgamated and became the virus laboratory. This laboratory is now equipped to provide the routine diagnostic services shown in Table 2. The table also indicates the type of test performed. For complement fixation, neutralization and agglutination tests noted whole blood,

As a service to our own Bureau of Sanitary Engineering and to local health departments, bacteriological and chemical examinations are also done on water and sewage samples received at the State laboratory.

The public is protected from mussel and clam poisoning by testing done in the State laboratory and the imposition of quarantine by the State Department of Public Health.

As already noted most public health and clin-

TABLE 2.—Diagnostic Services Offered By the Virus Laboratory

Disease	Comp. Fix.	Neut. Test	Animal Inoc.	Other
Equine Encephalomyelitis:				
Eastern	X	X	X	
Western	X	X	X	
St. Louis Encephalitis	X	X	X	
Lymphocytic Choriomeningitis	X	X		
Atypical Pneumonia		X	X	Cold Agglutination
Psittacosis Group	X		X	
Influenza	X			Chicken Cell Agglut.
Typhus Fever	X		X	
Lymphogranuloma Venereum	X		X	

allowed to clot, is required. It is imperative that two specimens be submitted, the first taken as early as possible in the disease, the second two to three weeks later. A rise in antibody titer is positive indication of infection with the virus used in the test. The material used for animal inoculation varies with the disease. In encephalitis it is brain tissue collected at autopsy. In atypical pneumonia and the psittacosis group it is sputum or nasal washings; in typhus fever, blood collected early in the course of the disease; in lymphogranuloma venereum, pus aspirated from the bubo. All specimens for animal inoculation must be sent in iced or frozen with dry ice.

Additional activities engaged in by the State laboratory are listed in Table 3. One group of workers is constantly engaged in testing for plague rodent organ and flea specimens which are collected throughout the State. This provides a constant check on the distribution of rodent plague in California.

The enteric disease section of the State laboratory does phage typing of *E. typhosa*. This service has already proved to be of significant importance in the epidemiological investigation of typhoid fever outbreaks. Also, a complete Salmonella typing service is maintained which is providing valuable data on the occurrence and distribution of the various pathogenic species of Salmonella.

The testing of foods and drugs provides an important link in the protection of the public against dangerous products and against fraud.

A serology consultative service is available to all physicians in the State. In diagnostic problem cases specimens may be sent to the State laboratory for checking where Kline, Kahn and quantitative Kolmer Wassermann tests are applied.

Periodically unknown blood samples are sent to all laboratories in the State that do serological tests for syphilis. Defects found are corrected, thereby going far to assure the physician dependable serology tests in whatever laboratory done.

cal laboratories in California use diagnostic antigens and antisera prepared in the State laboratory. This helps to assure a uniform level of sensitivity of test procedures. Typhoid vaccine and silver nitrate ampules are also prepared and distributed.

All technicians employed in public health laboratories are examined and certified by the State laboratory before they are allowed to work in public health laboratories. Through a system of examination and licensing of clinical labora-

TABLE 3.—Miscellaneous Services and Activities of the State Laboratory

1. Examination of rodents and ectoparasites for plague and tularemia
2. Phage typing—*E. typhosa*
3. Salmonella typing
4. Physical and chemical testing of foods and drugs
5. Checking serology as consultative service
6. Evaluation of serology done by local public health and clinical laboratories under premarital and prenatal acts
7. Bacteriological and chemical examination of sewage
8. Examination of shellfish for toxicity
9. Production and distribution of biologics—typhoid vaccine, diagnostic antigens and antisera; silver nitrate prophylactic
10. Examination and certification of public health laboratory technicians
11. Examination and licensing of clinical laboratory technologists and technicians
12. Inspection of public health and clinical laboratories
13. Inspection and licensing of manufacture and distribution of biologics, including testing of Brucella Vaccine distributed throughout the State
14. Training of public health laboratory technicians
15. Special research projects (virus diseases, rheumatic fever, enteric pathogens, evaluation of laboratory procedures, etc.)

tory technicians, another safeguard is established to insure qualified clinical laboratory work for the physician. Clinical laboratory technologists who are licensed to operate and direct clinical laboratories are given rigid examinations in a further effort to maintain high standards of work. All clinical laboratories are periodically inspected and efforts made to correct any deficiencies found.

Any biologic producing establishments not licensed by Federal agencies are licensed by the State laboratory. This includes blood and plasma banks. Such establishments are required to meet

minimum standards established by regulations of the State Board of Public Health.

A public health laboratory technician training program is also conducted by the State and a limited number of local laboratories. This is apprenticeship in type and is of six months' duration. A salary is paid during this training period. Since 1942 over 50 public health laboratory technicians have received this training. Since this training is centered in a limited number of centers, the uniformity of laboratory procedures is facilitated.

Finally the State laboratory staff is constantly engaged in investigative work designed to improve existing test procedures and to devise new tests that will assist in the diagnosis of communicable diseases. Projects are currently under

way in various virus diseases, enteric diseases, serology and comparative evaluation of culture and animal inoculation tests in tuberculosis. This is in addition to the fundamental research being conducted through the participation of the Rockefeller Foundation which was discussed above.

SUMMARY

From the foregoing review of the public health laboratory program in California it becomes evident that the services offered provide a valuable adjunct to the diagnostic armamentarium of the practicing physician. By full utilization of these services the physician can improve his own service to his patients and at the same time make a valuable contribution to the control of communicable diseases in his community.

Practical Application of Newer Methods in Control Of Rodent and Insect Pests*

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THE stimulus to research provided by the necessities of war has produced several new materials which have appreciable value in the control of rodent and insect pests. In rodent control we have two new effective poisons, known as "1080" and "Antu"; in insect control the virtues of "DDT" have been widely extolled, and the possibilities of "DDD" and "666" are still to be exploited.

Over-enthusiasm for these new materials should not cause us, however, to lose our perspective on the long range program for control of various pests of sanitary significance. These new materials are not substitutes for tried and tested methods of control. For example, no matter what new rodenticides may be developed, the most effective basis of urban rat control is still the "building out" of rodents, or rat-proofing, supplemented by the greatest possible reduction in food supply for the rodents. Anti-rat campaigns which neglect these important basic procedures are purely temporary in their effects. As another example, any effective mosquito control campaign must be based on elimination, as far as practicable, of all breeding places for mosquitoes.

The new materials are valuable supplements to basic control methods, but not substitutes for them. They must be used intelligently, bearing in mind always the particular advantages and limitations of each material and the conditions of each particular situation.

"Antu" is the trade name for alpha naphthyl

thiourea, which when ingested by rats causes a profuse oedema of the lungs, so that the animal literally drowns in its own juices. It is highly fatal to the brown rat, *Rattus norvegicus*, but is less effective against the black rat and the Alexandrian or roof rat. It is readily taken by rats when mixed with the usual baits. In the quantities used it does not appear to be lethal to domestic animals or man, so it is a relatively safe poison to use. As the brown rat is the most important urban rodent, its lesser effectiveness against other species of rats is not a serious disadvantage except in special cases.

The material commercially known as "1080" is a sodium fluoroacetate. Practically all fluorine compounds are poisonous, but this material is violently and very rapidly fatal in small doses and must therefore be used with the utmost care. The rats drink it readily in about 0.75 per cent (1 ounce in 1 gallon) solution without baiting, and small quantities in special containers can be exposed in protected places in rat infested areas, with a high percentage of acceptance. It is preferably exposed at night, and all poison containers and dead rats picked up the next morning. Practical field work so far performed indicates a much greater kill with this material than with any other rat poison taken internally. Its limitations are its high toxicity for all warm blooded animals, man included, and the extreme care necessary in its use. For the protection of the public it will be necessary to limit its use to official agencies only, in the same manner as we now limit the use of thallium sulphate.

"1080" may also be applied to grain baits and used against rural rodents such as ground squirrels.

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The remarkable tales told about DDT, the abbreviation of the chemical dichloro-diphenyl-trichloroethane (the chemists have a longer and more exact name for it, namely 2,2-bis (p-chlorophenyl)-1,1,1-trichloroethane) have perhaps produced expectations that may be overly great. These tales have not pointed out that the material has certain limitations. Unquestionably it is a valuable insecticide when used under appropriate conditions and with proper techniques and safeguards. But it is not a universal panacea for all arthropods, and like practically all insecticides it is a poison which must be handled carefully.

Against fleas and bedbugs it is absolutely sovereign when properly applied to the *areas* infested (not to the animals or humans). A 2.5 per cent emulsion in water, prepared by dilution of a 25 per cent (by weight) solution of DDT in xylene with an appropriate emulsifier, sprayed on the areas occupied by animals, will within a few days rid them of fleas for a considerable period. The writer personally knows of one case where two dogs and two cats have been absolutely free from fleas for over seven months as the result of one thorough spraying of the premises.

It appears reasonable to assume that in the presence of plague, health authorities will use DDT extensively as a spray or dust to kill fleas on premises where either infected rodents or human cases are found, in order to minimize the possibility of transmission of infection by fleas.

Spraying mattresses and bedsteads with a 5 per cent emulsion is also completely effective against bedbugs (*Cimex lectularius*) for several months. A supplementary spraying along the baseboards of bedrooms is helpful.

A heavy spraying with a 5 per cent emulsion or kerosene solution of DDT is fairly effective against most cockroaches, though it may not be too effective against the German roach.

Applied either as a 2.5 per cent or 5 per cent emulsion or oil solution to surfaces upon which flies and mosquitoes alight or rest, it is highly effective in killing adult flies (*Musca domestica* principally) and adult mosquitoes of all species. The residual effect of the deposit of DDT on such surfaces normally persists for from several weeks to several months, depending apparently upon the amount of exposure to sunlight, rain, and moisture.

The ordinary household-type hand sprayers are not well adapted to the application of DDT sprays to produce residuals on surfaces. It is preferably applied by power sprayers using nozzles which have been calibrated to determine their rate of discharge at various pressures. It can be applied by sprayers of the Hudson cylinder type, or by knapsack sprayers. Nozzles should produce a rather fine spray, but should not atomize the liquid. Nozzles should be held about 18 inches of the surface being sprayed.

Where discoloration from oil stain is not objectionable, or where there is no fire hazard, a 2.5 per cent solution of DDT in Diesel oil or stove oil is satisfactory and relatively cheap. Where oil stain is objectionable, as within houses,

the DDT-xylene-emulsifier mixture in water is preferable. Still other methods of application, including a wettable powder, are being developed, and paints containing DDT are also being marketed. The wettable powders can be dispersed in water and sprayed with less danger of toxic effects upon workmen, as compared with the solutions or emulsions.

The amount of DDT applied for residual effect is normally about 100 mgm. per square foot of surface area. This quantity is obtained by applying one gallon of 2.5 per cent DDT spray to 1,000 square feet of surface. Spraying pressures of from 40 to 60 pounds per square inch are satisfactory.

Applied thoroughly to houses, DDT residual spray will reduce appreciably the incidence of a mosquito transmitted disease, even though conditions do not permit effective measures for the control of mosquito breeding. In general, however, DDT residual spray is a valuable supplement to measures for the control of mosquito breeding or fly breeding, but it is not a substitute for such measures.

Applied in emulsion form or solution form to water breeding mosquito larvae, DDT is lethal to the larvae in extremely low dilutions (1 to 50,000,000 or even lower) in the laboratory, but in the field its results are irregular. In some breeding places it is spectacularly effective and economical; in others it is a complete or comparative failure. A great deal more practical work needs to be done in the field before we really understand its uses and limitations as a mosquito larvicide.

For temporary control of extensive mosquito breeding areas, the application of DDT either in oil solution or as a dust by airplanes has been quite effective against *Anopheles* breeding.

You have undoubtedly all heard of the remarkable success of powdered DDT (10 per cent micronized DDT in finely powdered pyrophyllite, talc or other dust) in controlling body lice and thus controlling typhus. This method of louse control is so effective that it is anticipated that it will ultimately displace all other delousing methods.

Used in dust form as an external parasiticide, it does not appear that DDT is toxic to humans. In solution or emulsion form, DDT is toxic if absorbed by the skin in sufficient quantities, but not if reasonable precautions as to washing are taken. A large number of men have handled DDT in various forms, during its manufacture, preparation for use, and application, and as yet practically no cases of human poisoning have been reported. In some cases it is possible that a dermatitis may have been caused by the organic solvents used (xylene and acetone) rather than by the DDT.

Taken internally, DDT is toxic. At least one suicide by ingestion has been reported, and the writer has heard of one group of prisoners of war, who did not read English, who stole and used DDT internally, with several fatalities resulting.

Apparently DDT needs to be handled with the same care that is required in the use of other toxic materials used as insecticides. Its misuse or careless use may produce tragedies similar to those which have occurred with the arsenic, fluorine and thallium compounds.

Two other new insecticides are now being studied, but so far sufficient quantities have not been available for extensive practical tests. The laboratory results indicate that they may be valuable insecticides also. One is known as "666" or $C_6H_6Cl_6$. The gamma isomer of this chemical appears to be about as toxic to insects as DDT, but the other isomers are of low toxicity. The other material is "DDD," a close relative, chemically, to DDT, but having one less chlorine atom in the molecule. It appears to have properties similar to DDT, and may be easier to manufacture, and perhaps lower in cost.

In the long run, new methods and new materials for the control of rodent and insect pests seldom revolutionize control. The time-tested and experienced-tried methods and materials continue to be used, because they are effective. The new methods and materials, after a large initial ballyhoo, find their proper relative place in the scheme of operations. In the end they reinforce but seldom eliminate the old standbys. All methods and materials have their advantages and limitations according to conditions. Those which are new and effective extend our ability to control our environment in the interest of health and comfort.

DISCUSSION BY JOHN C. DEMENT, M.D.

It is a great pleasure to have been asked to discuss this very timely paper of Mr. Gray's. I do not feel competent to discuss its technical aspects, but would like to mention briefly some of the public health implications of the problem with which it deals—that of man's age-long battle against animals and insects which are vectors of disease. Zinser has traced the influence that this battle has had on history and on civilization in his popular "Rats, Lice and History." We read of plague in China or North Africa and are inclined to think of this as an interesting but remote medical problem, forgetting that plague in California, like the poor, is always with us, endemic in its sylvatic form in many areas of the State, with every now and then a human case of two to remind us of its potential threat. Typhus is reported in Eastern Europe or Japan, far removed from us; but, here in California, we have discovered that we have our own typhus problem—murine typhus transmitted not by the louse but by the rodent borne flea. In the last ten years, 283 cases of murine typhus have been reported in California, with a five-year average for the period 1936-1940 of 19 cases a year; and for 1940-1945, 37.6 or twice as many. During 1944, cases of murine typhus in the United States increased 16.6 per cent over 1943, and this is believed by those studying the problem to be due to an actual increase as well as to better reporting of cases by state and local health departments.

The approach to this problem is not the same

as in the louse-borne epidemic typhus we encountered in Europe. There DDT dusting of humans combined with vaccination proved spectacularly successful in the control of epidemics in Italy and Germany. The establishment of border control centers along the northern border of France by the Ministry of Prisoners, Deportees and Refugees, effectively prevented the introduction of typhus in epidemic form into France, although over two million French nationals were returned to their own country in a relatively short time. VE-Day came before these reception centers were completed and the organization functioning smoothly. In spite of this, however, few cases of typhus escaped the preliminary screening at improvised reception centers in Germany and the more comprehensive screening at the border control stations. Theoretically, all of the returning prisoners and civilian deportees were screened and dusted with DDT in Germany. Remarkably few cases of louse infestation were found at the border reception centers and only a few cases of actual typhus ever reached these centers. Those that did were immediately removed to French military and civilian hospitals and strictly isolated, and all persons processed through these centers were again dusted with DDT. Sometimes this dusting routine broke down due to inability to keep the stocks of DDT powder where they were needed, but on the whole the system worked well. With the exception of a minor epidemic in and around Paris in which some 60 cases were reported and which was probably introduced by air-borne returnees flown directly from Germany, I know of no actual epidemic of typhus in France. We had large numbers of Polish, Russian and Italian displaced persons to take care of in poorly equipped camps with wholly inadequate housing and sanitary facilities, but the incidence of louse infestation was remarkably low due to the use of DDT, and no cases of typhus occurred as far as I know in any of these camps. On the other hand the German army, without DDT, apparently had a high incidence of louse infestation as judged by the condition of prisoners of war and the presence of lice in captured bunkers and barracks formerly occupied by them. The German concentration camps were notoriously lousy and typhus prevalent.

The control of murine typhus on the other hand is a question of the control of the rat and mouse population. With a mortality of something less than 5 per cent and still a relatively small number of human cases, extensive vaccination is not practicable. Control of the rodent population not only will control murine typhus but also leptospirosis and the possibility of rat borne plague. As Mr. Gray has so well pointed out, basic proven control measures, not only against rodents but against insect vectors, still form the backbone of our attack and these newer agents must be fitted into their proper place in the control program. No program as yet based solely on killing or trapping rodents has proved effective. Rat-

proofing of buildings and protection of food supplies against rats and mice still must be carried on. The control of mosquitoes and flies is the control of their breeding not the killing of the mature insects. These are measures which cannot be left to the individual citizen but which must

be carried on as an organized community effort. It is our responsibility as physicians to educate our own communities as to the need for these measures, and our responsibility as citizens to see that they are carried out.

Malpractice Litigation as It Concerns The Dermatologist*

CLEMENT E. COUNTER, M.D., Long Beach

THERE are two reasons this subject has been chosen for the chairman's address to this 23rd annual session of the section on dermatology and syphilology of the California Medical Association.

One of these reasons is a statement made by Dr. Louis J. Regan at a meeting of section officers of the California Medical Association in January, 1946. He said that if the present rate of malpractice litigation continues each of us will be sued every 11 years. This is a statement of the average and it actually means that some of us will be sued oftener and that a few will not be in court as often as once every 11 years.

The other reason is that your chairman and his associate in practice have just finished a year of irritation and distraction from practice that goes with a malpractice civil suit in preparation for court. There were the long tedious pretrial depositions requiring many visits to the plaintiff lawyers office. There was much apprehension of the unexpected. We could not see where there was merit in the complaint but in spite of reassurance by our attorney we feared that some unseen danger lurked. It seemed there must be some better reason for the complaint than was given, since the plaintiff was willing to risk so much expense in preparing his case when we seemed to have such a good defense. We did much searching of literature references. Finally, there was the 14 days in court during which our office was closed half time. The judge and jury were kind to us and the defendants were completely exonerated.

These reasons, I say, have suggested the subject of malpractice litigation.

Thirty-six dermatologists of Los Angeles County were questioned this year about their personal experience with malpractice claims. Thirty have never had a complaint of malpractice filed against them. Six had been named as defendants in five suits. Seven of the 30 who have never been brought to court have had eight threatened complaints. These never became suits but they are here included in this investigation to give us a

little more information on the sources from which one may expect danger on the matter of alleged malpractice. All malpractice suits and threatened malpractice complaints here considered have occurred in the past ten years.

The five malpractice claims were as follows:

1. A syphilitic patient having a darkfield positive genital ulcer and a negative blood Wassermann reaction was given treatment so that she never developed a positive Wassermann reaction. She later alleged that she had been wrongly diagnosed and wrongly treated for syphilis because she had never developed a positive blood test.

2. A patient who suffered 90 per cent loss of vision from syphilitic optic atrophy had begun losing eyesight during the administration of a long course of tryparsamide. The tryparsamide was used to treat the neurosyphilis which was responsible for the blindness. Twenty-three injections of pentavalent arsenical preparations were given before the patient complained of eye symptoms. Tryparsamide was being given at the time vision disturbances were first experienced. Sixteen weekly 3 gm. injections had been given when the patient first complained of hazy vision. Tryparsamide was immediately discontinued but the patient claimed that her blindness was due to her physician's carelessness.

3. A patient who was successfully treated for acne alleged that the residual acne scars had been produced by over treatment with x-rays.

4. In a successful case of roentgen ray treatment of an epithelioma on the cheek, the eyelids were not actually covered with lead. The x-rays were localized to the lesion by means of a cone. Later, cataracts developed and the patient charged that injury to the eyes by x-rays when they were not covered during treatment of the epithelioma was the cause of the cataracts.

5. A patient having a contact dermatitis was studied by means of patch tests. A positive reaction was obtained from one of the patches. Later a complaint was filed claiming that the entire dermatitis had been produced by the patch tests.

Of the eight threatened complaints which were not followed by actual litigation, four concerned alleged misuse and over-treatment with x-rays. One alleged carelessness in an attempted scar

* Chairman's address. Read before the Section on Dermatology and Syphilology, at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

removal. No guarantee of good results had been given. One patient who was unhappy because he developed increased dermatitis charged that his doctor had given him medicine that produced the bad result. After considerable effort it was shown that the medicine actually responsible for his dermatitis was a sample which he had applied from his own stock on his own responsibility. The last of this series was the case of a patient who had a mole removed and a keloid developed in the headed wound. The patient charged that careless and bunglesome surgery were responsible for the untoward result.

Two of these eight threatened complaints were made by patients to avoid the payment of legitimate fees. These were not unreasonable fees. In one instance the fee had been agreed on before the work was done. In the other the fee was five dollars which was charged for two office treatments.

Twenty-three of the 36 dermatologists interviewed had never been sued nor even threatened with suit. Fourteen of these fortunate physicians have been in practice more than ten years. Three have practiced dermatology more than 25 years. These doctors have our congratulations and sincere good wishes that their good fortune may continue.

It has been noted by Dr. Regan¹ through his close contact with litigation against physicians that malpractice complaints against general practitioners in the field of dermatology and syphilology predominantly include the claims that arsenical preparations of improper dosage or wrong character were administered. Several of these patients have had severe exfoliative dermatitis, and at last one has died. Other claims in this field against the general physician are the over-treatment with some type of light treatment, and the claim of injury due to local applications of a too concentrated character.

It is stated that almost all malpractice claims are instigated by physicians² and this probably is the chief cause of such litigation. There is no denying that the results are deplorable, but when the question is asked, "Why is it that physicians are so prone to criticize their colleagues?" it should be remembered that that reaction on the part of the physicians is only natural and perfectly human.

The criticizing of one by another is a natural human trait and is one not peculiar to physicians, nor can it be explained by the striking individualism of physicians. Who is less individualistic than the barber who dares not open or close his shop to suit his own convenience, but must follow the exact opening and closing time of all other barbers in his vicinity for fear of loosing customers.

There is the example of the barber of a large city hotel who gave a guest a hair trim. Later the following day he was again engaged by this same guest to perform other tonsorial service. Upon finishing the service the barber informed the

guest that he really needed a hair trim. "That's peculiar," said the guest, "I just had a hair trim yesterday." At that the barber began to describe the many shortcomings of the barber, whoever he might be, who was responsible for such a haircut. The guest thought that if his hair was so very unsightly he should have it trimmed again and the barber was permitted again to trim his hair. While the second hair trim was in progress the barber insisted that if the poor workman could be found who had previously worked on him he should be made to correct his mistake and carelessness without charge. The guest waited until his hair was trimmed for the second time and then told the barber that it was he, and none other, who was that careless one. The barber lost a fee, but suffered no further damage.

There is a similar ring to the story told by Regan³ of the two physicians who practiced as partners on the outskirts of Los Angeles. They had an equipment to administer x-ray therapy, and employed a technician. A patient presented an eruption on one hand. One of the partners, Dr. A, prescribed a course of x-ray treatments. These were administered by the technician. Several weeks later the patient returned to the office. At this time Dr. A was absent from the city. The patient was sent in to Dr. B who was seeing her for the first time. Without giving the patient an opportunity even to state her name, Dr. B exclaimed: "Good heavens, woman, someone has certainly given you a terrible x-ray burn!" It is said that the punishment fitted the crime this time. Dr. B was equally liable with his partner for the negligence of their employee. Unlike the barber, in this instance there was further financial damage beyond the loss of ordinary professional fees.

Like those of the talkative criticizing barber, the remarks of Dr. B were unnecessary and actually untruthful. The statement of the barber (and of Dr. B) was intended to convince the one being served of his own personal accomplishments and great acumen in being able to locate imperfection quickly. If all careless fault-finders were to suffer similar experiences of self-appointed punishment regularly, the thing known as "the malpractice problem" would quickly end.

It is my observation that dermatologists among many others have learned the lesson intended to be taught by these statements. They have learned that they often see the patient subsequently and have the advantages that go with being in that favorable position of being the last one to see the patient. They also have learned that they may raise themselves by praising the acts of their colleagues. One who has learned well this lesson says to his patient that the other physician is a gentleman or lady, well-trained, careful and capable. What he does not need to say, because it is so eloquently implied, is that he himself is also a fine gentleman because he can recognize those virtues in his fellow physician.

It is the practical application of the principle taught by the Great Physician Himself when He

said, "Everyone that exalteth himself shall be abased, and he that humbleth himself shall be exalted." (Luke 18:14.)

It is obedience to the laws which should govern all human relations. These laws were so grandly summarized by Jesus Christ when He answered his learned questioner on which is the *great* commandment—which is the great law. He said, "Thou shalt love the Lord thy God with all thy heart, and with all thy soul, and with all thy mind. This is the first and great commandment. And the second is like unto it, Thou shalt love thy neighbor as thyself." (Matthew 22:37-39.)

What physician is there who, thinking as much of his neighbor physician as he does of himself, could depreciate his colleague in front of his patient? No, no physician could. Practical Christianity offers a complete solution to the malpractice problem.

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THE MEASURE OF A MAN

What is it to cease breathing, but to free the breath from its restless tides, that it may rise and expand and seek God unencumbered?—Kahlil Gibran.

The measure of a man is the man himself. Regardless of race or religion he stands alone to receive the judgment of his peers. Judgments of character based on color or on nationality, race or creed, have a foundation as unfirm as quicksand. Every race, every nation, has brought forth saints and sinners, savants and imbeciles, philanthropists and tyrants. Good and evil are curiously blended in us all and the virtues of each must be weighed with his faults. Black or white, Jew, Gentile or Pagan, each is a human being. Be his skin dark or fair, he may be noble or ignoble, learned or untaught, generous or selfish, kind or cruel. Whatever his qualities, he has them, not as the representative of a group, but as a solitary individual who can answer to God and man for his own conduct alone.

Man, a gregarious animal, possesses a strong herd instinct which has been necessary to his security. Individuals who deviate in any noticeable degree from the herd pattern suffer disapproval and discipline to a greater or less degree. Whether the deviation be physical due to race, or mental because of religious or political differences, the majority will either seek to force or absorb the minority into the prevailing pattern, or wreak vengeance upon it. Only a civilization which gives a high sense of social consciousness and responsibility can destroy or modify this tendency, which becomes greater in proportion as minority groups encroach upon the security

and privileges of the majority. Both majority and minority groups in this nation share an awesome responsibility one to another.

The profession of medicine is altruistic and international in its ideals and endeavors. Its universal purpose is the alleviation of human suffering and the betterment of the physical and mental status of humanity in all lands. Physicians, better than others, know that the human mind and body is shaped of the same materials and destroyed by the same diseases whether the skin be white, brown or black. Physicians, then, should lead other men to an equally clear conception of the great truth of human brotherhood. Until this haggard world accepts the belief that all nations can dwell together in friendship and harmony, war and bloodshed will be our common lot.

Our own county medical association, soon to have a membership of more than four thousand highly trained physicians, has never inquired of an applicant for membership concerning his race or religion. If his training and character are sound, it matters not whether he be emigre or Mayflower descendant. Men and women of many races and creeds are and have been active partners in its work. Let us not speak of tolerance, lest it imply the existence of intolerance. Let us continue, in the future as in the past, to set an example of harmonious work and accomplishment, and disregarding nativity and creed, bestow honor and affection upon those who best serve science and the welfare of mankind.—E.T.R., in the *Bulletin* of the Los Angeles County Medical Association.



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EDITORIALS

PURIFIED GLYCOSIDES OF DIGITALIS

The recent progress in the synthesis and clinical use of the purified glycosides of digitalis purpurea and lanata has been an important contribution to cardiac therapy. The importance of fundamental chemical research in providing data that can subsequently be used to advantage in clinical medicine has again been amply confirmed. However, just as in the case of the endocrine products, a plethora of names is appearing to plague the practitioner who would use the newer preparations.

In the past, digitalis folia, USP, was the only commonly used digitalis product, although on occasion digifoline, digifortis, thevetin, urginin, etc., were used. Ouabain was the only commonly used preparation for rapid digitalis effect. In recent studies, the purer preparations of digoxin, cedilanid and digitoxin have been shown to be effective and can be used both orally and intravenously. Digoxin and cedilanid are derived from digitalis lanata. Following the excellent work of Gold, et al., who emphasized the importance of digitoxin, three commercial products of this glycoside are available—digitaline natielle, purodigin and crystodigin. It is not clear how these three preparations differ in composition, if they significantly do differ. To digitalize and maintain a patient with cardiac failure one has at present the choice of at least eight preparations derived from digitalis bodies, with different names and dosages, but with similar pharmacologic effects.

Oral digitalis folia, USP, has proved itself over many years to be an effective therapeutic agent in cases requiring only average speed of digitalization. It has not been entirely satisfactory for a number of reasons. It must be biologically assayed, each preparation often differs in potency, and only 10-20 per cent of a given oral dose is absorbed. Gold, et al., showed that in a number of oral preparations of digitalis from various pharmaceutical firms, the potency varied 300 per cent between the weakest and the strongest, yet all were labeled USP. It is clear that these pre-

parations would not be interchangeable. The changing values of the USP unit of digitalis with each revision of the U.S. Pharmacopeia has been confusing. The digitalis of USP XI was 30-50 per cent stronger than that of USP X. Scarcely had this been emphasized in articles and editorials, warning against overdosages with USP XI digitalis, when USP XII was released, in which digitalis strength was reduced to a point halfway between USP X and USP XI. We must now be on the alert for digitalis underdosage. Despite these shortcomings, digitalis folia is an excellent and effective preparation for oral use in the average case. The variability in the dosage requirement of the patient makes it necessary to observe the patient closely for the earliest toxic symptoms, regardless of the strength of the digitalis preparation used.

When the clinical situation is urgent and therapy must necessarily be rapid, the use of the purified glycosides has been of greatest aid. In severe cardiac failure, pulmonary edema, auricular fibrillation or flutter with rapid ventricular rates and cardiac failure, the intravenous use of the purified glycosides (ouabain, cedilanid, digoxin, digitoxin) has been both dramatically effective and without significant toxic sequelae.

The recommendation of the Cornell group of investigators that digitoxin be used in single-dose digitalization as a routine procedure has evoked considerable interest. It has not, however, been universally accepted, largely because the incidence of vomiting, while less with digitalization with digitoxin in a single dose than with ordinary digitalis in a single dose, is still greater than with slow digitalization. It may be that a compromise will be reached and the pure glycosides given in divided dosage over a 24-hour period, rather than in a single dose. Certainly care must be used in rapid one-dose digitalization in older people and in patients who have developed cardiac failure following an acute myocardial infarction. Oral use of the purified glycosides would not ap-

pear to have any significant advantage over oral digitalis folia for the purpose of maintaining digitalis effect, except in rare cases. In a recent study, Sokolow and Chamberlain found that cediland and digitalis folia were interchangeable at maintenance doses of 1.5 mg. and 0.15 gm., respectively. The maintenance dose of digitoxin was found by Gold and his group to be in the range of 0.1 and 0.2 mg. Care must be used to prescribe digitalis preparations by weight rather than by cat units when they are to be used orally. The cat unit is based on intravenous use of the drug and the factor of absorption is most important in oral medication. When the purer glycosides are used intravenously in man, roughly three to five cat units of each will digitalize.

A safe procedure for the practitioner who will

want to take advantage of these newer glycosides will be to learn the use of one or two preparations well. Any of the purified glycoside group will be adequate for rapid oral or intravenous digitalization, the variabilities being dosage, speed of action and excretion; the pharmacologic effects do not differ. Once one has gained experience with a representative of the group, one will have at hand an exceedingly useful drug for cardiac emergencies. When the situation does not require rapid digitalization, the use of ordinary digitalis folia over a period of two to four days will prove adequate in most cases. The choice of digitalis preparation in cardiac therapy will depend on the speed with which digitalization is required and the familiarity that the physician has with the use of any given preparation.

The A.M.A. and the Future

Successful completion of the A.M.A. 1946 annual session in San Francisco brought forth some highly complimentary remarks from the eighty-five hundred physicians attending from all parts of the country. While not all those at the meeting were able to get the hotel accommodations they wished, there was praise everywhere for the manner in which the scientific, technical and business meetings were arranged, for the handling of hotel space and the general arrangements for all the myriad details entering into a larger meeting. The local committee on arrangements, representing a large number of practising members of the San Francisco County Medical Society, did its job in splendid fashion and deserves all the credit given it.

On the scientific side, the meeting presented the usual high quality exhibits and scientific meetings. On the technical side, the exhibits were numerous, interesting and splendidly laid out for the convenience of the visiting physicians. The weather was ideal and, aside from the street car strike prevailing during part of the meeting, everything for the comfort of the members was in good shape.

On the business end, however, there seems to be much to be desired. The House of Delegates, meeting on three days of the session, covered an unusually large amount of ground and, judging by remarks dropped here and there by many members, probably moved so fast that some important pieces of business were left out of consideration or were hurriedly passed over.

One such piece of business—and this one came in for criticism by members of the House of Delegates from numerous states—was the report of the public relations survey of the A.M.A. made by Raymond Rich and Associates. This report, ordered by the A.M.A. Board of Trustees earlier this year, had been anxiously awaited by physicians throughout the country. When time

came for its presentation, the House of Delegates was given a concise interpretation of it by the Board of Trustees. Actual copies of the report were not available to the members of the House of Delegates despite requests for such copies and one rather pointed question from the floor as to how intelligent questions about the report might be asked by members of the House if they did not have access to the report itself.

It is recognized, of course, that any survey of public relations and public opinion, if it is worth its cost, must bring out the poor points of an organization as well as the strong. But it is acknowledged too that the medical profession will not be well served by any washing of dirty linen in public. Probability is that the Board of Trustees had not had time or opportunity to make a really thorough study of this report before the San Francisco meeting. Nevertheless, it is somewhat surprising for the legislative body of the A.M.A. to be denied access to a well conceived study of a subject which goes to the very roots of present-day American medicine and its organizations.

If the members of the A.M.A. House of Delegates cannot be trusted with information of a confidential nature, they should not be permitted to sit in that House. There is precedent for such action. If the members of the legislative body of American medicine are not allowed to legislate, there seems a question as to the need of establishing or operating a legislative session within the structure of the A.M.A.

The future of American medicine may well be at stake in the findings of the Rich report. The social and economic side of American medicine, as well as the scientific side, may well be seriously affected by the decisions of the A.M.A. on this report. In such circumstances it appears that full consideration should be given this report by the full membership of the House of Delegates. If there are weak points in the armamentarium of American medicine, let them be brought to light

by an unbiased surveyor, analyzed and corrected. If there are strong points, let them be made the basis for capital gains.

It is sincerely to be hoped that the December

meeting of the A.M.A. House of Delegates will bring to the membership of the House a full copy of the Rich report and full opportunity to discuss this report, its analyses and recommendations.

The Laboratory in Medicine and Public Health

The public health laboratory and the diagnostic clinical laboratory both serve important but distinct functions in the prevention and management of disease.

The organization and scope of the public health laboratories of California have been considered in this issue of CALIFORNIA MEDICINE. The organization is properly decentralized. Thus the State laboratory does not usurp the duties of the city or county organization but aids them in their development and in the maintenance of high standards. It provides the essential services where they cannot be provided locally. The laboratory services performed by the system of county and state public health laboratories are concerned properly with matters of public health importance, such as adequate control of the purity of water and food, in control of epidemic disease and other factors involving environmental sanitation. Thus, studies conducted by the public health laboratories revealed a dangerous degree of sewage pollution to exist on some of the popular ocean beaches. This led inevitably to quarantine of the beaches pending application of the corrective measures of sanitary engineering. Joint studies supported by public health laboratories, industry and Hooper Foundation of the University of California have done much to develop and maintain the high standards of canning in our state. The recently developed Virus Research Laboratory supported in part by the Rockefeller Foundation and under the jurisdiction of the State Health Department contributes importantly in safe-guarding public health. As a policy it would seem desirable to have such research activities closely linked to Medical schools and schools of Public Health.

The public health laboratories have a wide field

of important activities and need not, indeed should not, encroach upon the field of the hospital or diagnostic laboratories. The diagnostic laboratory is an important element in the organization contributing to adequate care of the patient. Its services should be readily available to the physician and it should be under the direction of a well trained pathologist. The pathologist must see that a high standard of laboratory service is available and should act as a consultant with the physician. There has, in fact, been a shortage of trained pathologists, but it appears that this is being overcome and an increasing number of able young men are choosing pathology as a specialty. The direct consideration of diagnostic problems by the pathologist and the attending physician has a great advantage over the impersonal and often delayed report coming out of a remote laboratory. Development of high-grade laboratory services in conjunction with adequate hospital facilities throughout the state constitutes one of our more important health needs. The young physician needs an adequate work shop. He is not content with "guesswork" medicine. Our needs should be clarified by the hospital survey currently being conducted by the State Health Department. When the needs are defined, a concerted effort should be made to meet them.

The research laboratories that ultimately contribute to medicine represent nearly all branches of science. More direct in their contribution are the investigations emanating from the laboratories of the basic medical sciences. New techniques of importance will continue to filter down from "pure" science to medical science and into the laboratories where they are applied in the prevention and care of disease. The role of the laboratory in medicine and public health will inevitably be one of increasing importance.

Cash Sickness Indemnities

When the California Legislature passed the cash sickness indemnity law at the 1946 special session it launched the State on a social security voyage which must be undertaken with a green crew and with only one chart. The crew is now being assembled and trained, the chart being surveyed.

The law is of particular interest to physicians because under its terms they are required to certify the unemployability of the applicant for benefits and to estimate the period of time his disability will continue.

Rhode Island is the state which has supplied

the chart for California. There a cash sickness indemnity law has been in effect since 1942, with benefits paid since 1943. Rhode Island's was the experience on which the proponents of the California law based their claims and relied for their figures and conclusions.

Now comes a review of the Rhode Island situation by the *Research Council for Economic Security*, a Chicago research organization catering principally to insurance underwriters. The review points to an increment in the reserve fund in 1943, the first year of benefit payments. In that year the fund took in \$4,700,000 in taxes and

disbursed \$2,900,000 in benefits. The increment of \$1,800,000 on top of 1942 collections of \$1,600,000 and no benefits, brought the reserve fund up to \$3,400,000.

At that point the gain in reserves ended. In 1944 the fund paid out \$600,000 more than its receipts and in 1945 the drain was another \$400,000. This left the reserve fund at \$2,400,000 at the end of 1945. For 1946 this review estimates collections at \$3,500,000 and disbursements at \$4,800,000. If this estimate comes true, the reserve fund at the close of this year would be down to \$1,100,000, or half a million dollars less than the original cushion collected in 1942 before payment of benefits began.

From this review the *Research Council* concludes that the tax rate of 1 per cent on Rhode Island wages has consistently been too low. It recommends that a rate of 1.5 per cent should be charged. Further, it points to the snowball tendency of social security programs as evidenced in

Germany, Great Britain, New Zealand and other countries.

While some of the lessons taught by Rhode Island were given consideration by California's legislators in passing this bill in this State, it is also remembered that many of the Rhode Island experiences were either brushed aside or lightly acknowledged and passed over. The tax rate of 1 per cent was followed to the letter, but some of the benefit provisions in the smaller state were toned down in the California measure to preserve the reserve fund. Whether or not the California provisions will produce the desired result, time alone will tell.

California is now launched on its voyage. The ship is ready, the captain and crew standing by until funds for benefit payments become available. It is sincerely to be hoped that the initial four years' experience in Rhode Island will not be duplicated here and shoal water approached by so large a vessel as the California ship promises to be.

ARMY GROUP CLAIMS SUPERIORITY OF SN 7618 AS ANTIMALARIAL

The superiority of chloroquine, also known as SN 7618, over atabrine and quinine in the treatment of vivax malaria is claimed in an article appearing in the June 20 issue of *The Journal of the American Medical Association*.

The authors of this report—Major Harry Most, Capt. Irving M. London, Capt. Charles A. Kane, Capt. Paul H. Lavietes, Capt. Edmund F. Schroeder and Col. Joseph M. Hayman, Jr., Medical Corps, Army of the United States—conducted the study at the Tropical Disease Section of the Moore General Hospital, Swannanoa, N. C.

The form of malaria caused by the *Plasmodium vivax* produces an attack every 48 hours. The authors state: "The effectiveness of chloroquine in controlling fever during the treatment of the acute attack of vivax malaria is striking. In a total of 244 patients treated with the drug according to plans A, B and C [one day, four day and seven day treatment schedules], only five patients, or 2.1 per cent, had fever (temperature of 100 F. or more) the day after treatment was begun or subsequently. In contrast to these observations, treatment with quinine in 184 attacks and with quinacrine [atabrine] in 391 attacks was associated with fever on the second or on a later day in 8.7 and 8.0 per cent respectively of the patients treated. Thus, chloroquine is more effective than quinine or quinacrine in promptly controlling fever during treatment of acute attacks of vivax malaria. This superiority is manifest in infections both of Mediterranean and of Pacific origin"

Moreover, the authors continue, "chloroquine is at least as good as quinine or quinacrine in the control of all symptoms and is superior to one or the other in the control of some symptoms.

"Headache and backache are relieved more rapidly with chloroquine or quinine than with quinacrine. Quinine is more effective than quinacrine in the control of generalized aching but is not significantly better than chloroquine. Weakness, dizziness and light-headedness disappear more readily with chloroquine or quinacrine than with quinine. Nausea persists longer in patients treated with quinine than in those treated with the other two. The effect of each of these drugs on the duration of vomiting, abdominal pain and abdominal tenderness is essentially the same."

Although none of these drugs produce a complete cure of malaria, the investigators are confident that from the data presented it is evident that chloroquine is superior to both quinine and quinacrine hydrochloride because "the interval before relapse after treatment with chloroquine will be on the average at least five weeks longer than after quinine and about two weeks longer than after quinacrine hydrochloride. Only a negligible number of patients treated with chloroquine will have relapses during the first 50 days after treatment. Thus not only does chloroquine promptly control symptoms, fever and parasitemia [parasites in the blood], but, in addition, treatment with that drug results in freedom from another attack for a period of approximately two months."



Clinical-Pathological Conference

PRESENTATION OF CASE*

M. S., female, age 12. This child was first admitted to the University of California Hospital in November, 1936, with the symptoms of repeated episodes of vomiting, diarrhea, polydipsia and polyuria. She manifested a marked polyphagia with failure to gain weight and sugar was present in the urine. She had been treated by her local physician earlier in the year with a low carbohydrate, fat-free diet without insulin. Though the symptoms regressed somewhat, the gain in health was only temporary and for four months preceding the hospital entry she had shown easy fatigability and lassitude. After one week of insulin therapy the urines became sugar free. She was discharged from the hospital on 7 units of regular insulin three times a day (diet not recorded).

In the interval between 1937 and 1941 the patient entered the hospital several times. These entries are summarized briefly below.

November 10 to 18, 1937: Symptoms were initiated by nausea and vomiting followed by polyuria, polydipsia, disorientation, mild delirium, and Kussmaul breathing. Blood sugar was 465 mg. per cent, and CO_2 combining power 11.8 volumes per cent. Urine: acetone 4 plus; sugar, red reduction. Intravenous and subcutaneous fluids and insulin resulted in rapid recovery.

November 29 to 30, 1937: Symptoms of nervousness, restlessness, and, finally shock followed shortly an overdosage of insulin. The blood sugar was 44 mg. per cent. Intravenous glucose resulted in immediate recovery. Insulin dosage and diet were stabilized as follows: Diet: C 90, P 55, F 130, with 6 units (PZI) and 6 units (RI) a.c. breakfast and a.c. dinner.

February 8 to 11, 1939: Symptoms of apprehension, vomiting and chest pains accompanied by a blood sugar of 370 mg. per cent, CO_2 combining power of 12 volumes per cent. Urine: acetone 4 plus; sugar, red reduction. Parenteral fluids and insulin produced rapid recovery.

May 11 to 13, 1939: An episode of vomiting followed a mild upper respiratory infection. Blood sugar was 412 mg. per cent, CO_2 combining power 26 volumes per cent. Urine: acetone 3 plus; sugar, red reduction. Parenteral fluids and insulin produced improvement.

March 7 to 17, 1940: An infected hematoma developed after a blow on the mesial aspect of the left knee. Recovery followed surgical drainage and systemic administration of sulfonamides. Diet: C 100, P 65, F 100. Insulin dosage: 17 U (RI) and 17 U (PZI) a.c. breakfast and 11 U (RI) and 11 U (PZI) a.c. dinner.

August 21 to 22, 1941: A generalized abdominal pain of 3 days which had subsided when the patient reached the hospital was diagnosed as pos-

sible subsiding appendicitis. No treatment was given.

Eighth Entry: September 27 to November 29, 1943.

Present Illness: Prior to going to a Diabetic Summer Camp in July, 1943, the patient had been in good health and her diabetes well controlled. She was on a diet of carbohydrate 125, protein 80 and fat 85 and taking an insulin dosage of 34 units before breakfast (17 units of regular insulin and 17 units of protamine zinc insulin mixed), and 20 units before dinner (10 units of regular and 10 units of protamine zinc insulin mixed). On this regime she presented no subjective complaints save for a rare episode of apprehension, sweating and restlessness. (These were quickly alleviated by orange juice or candy). About August 3, 1943, she noticed a gradual onset of more frequent and severe episodes of this type until within a week after this they were occurring daily. During this period her insulin had been gradually reduced to zero without the appearance of sugar in the urine, or alleviation of the symptoms. Her diet was then increased to carbohydrate 175, protein 125 and fat 150. She was considerably improved, but was still frequently awakened about 2 to 5 a.m. with apprehension, restlessness and sweating. Since the onset of these symptoms, she has had a number of convulsions, one of which required 40 cubes of sugar for relief. She had received no insulin since August 10, 1943. The patient was admitted to the hospital for further study on September 27, 1943.

Physical Examination: Temperature 37° C.; pulse 86; respiration 18; blood pressure 115/85. General examination showed a well developed and well nourished girl appearing the stated age of 19 years and in no acute distress. The skin was clear and without blemishes. The right pupil was somewhat larger than the left and the right eye slit wider than the left. The pupils were round and regular and reacted to light and accommodation. Extra ocular movements were normal. The fundi presented no lesions. There were numerous small fillings in the teeth, but in general, the teeth were in good condition. The tonsils were moderately enlarged. The chest examination was normal to palpation, percussion and auscultation. The area of cardiac dullness was not enlarged. PMI at the 5th interspace within the midclavicular line. Rate and rhythm regular. No murmurs or abnormal sounds. The abdomen was flat and no masses or organs were palpable. The genitalia and back were normal. Reflexes were equal and average intensity.

Laboratory Examination: Hemoglobin 90 per cent; red blood cells 4.8 million; white blood cells 10,000. Polymorphonuclear neutrophiles 65 per cent; lymphocytes 30 per cent; monocytes 5 per cent. The urine specific gravity was 1.020; pH 6.0; sugar 0; albumin 0; acetone 0; sediment—rare red blood cells and white blood cell, numer-

* Taken from the Clinical-Pathological Conference, Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

ous epithelial cells. Fasting blood sugar determinations varied from 36 mg. per cent to 47 mg. per cent. A Glucose Tolerance Test on September 23, 1943, was as follows: Fasting 47 mg. per cent; $\frac{1}{2}$ hour—78 mg. per cent; 1 hour—96 mg. per cent; 2 hours—91 mg. per cent. (Test terminated at 2 hours.) Plasma chlorides 533 mg. per cent as sodium chloride. Plasma cholesterol 176 mg. per cent. K. and K. negative. I. V. hippuric acid: 1.4 gm. excreted in the urine in one hour. P.S.P. 62 per cent excreted in 2 hours. A flat film of the abdomen showed no lesions. A skull film showed no evidence of enlargement or erosion of the sela turcica.

Course: During the course of the hospital studies, the patient experienced several severe episodes of apprehension, restlessness and sweating. In one such episode, the patient was unable to be aroused. The blood sugar at this time was 36 mg. per cent. These reactions were successfully treated with intravenous glucose. On October 6, 1943, an exploratory laparotomy was performed.

J. R.

DISCUSSION BY CLINICIAN

DR. ALLAN T. KENYON*: We have in effect a well established diabetes mellitus which has existed for some years and which has eventually disappeared and been transformed into a hypoglycemia state. This unusual course is beyond my experience and must accordingly be approached in a somewhat theoretical manner. The literature does indeed record examples of this sort, but I am unaware of the actual pathological findings in these circumstances.

Diabetes mellitus as we see it is a resultant of pancreatic deficit on the one hand and those adrenal and pituitary factors opposing the action of insulin on the other. It is not always easy precisely to state which force or deficit determines the disorder in given instances. As you know, gross destruction of the islets in ordinary diabetes is rare. Detailed cytological study may show deficiencies in beta cell granulation or little or nothing of even this. It is interesting in view of these relatively minor morphological defects that recovery of effective islet cell function is as rare as it seems to be.

Intervening destructive disease of either the adrenal or pituitary body would be expected to modify existing diabetes. No good evidence of gross adrenal or pituitary disease is provided by the record. Pigmentation, blood pressure, body hair and menstruation were unaltered. Existence of some peculiar and isolated adrenal or pituitary defect influencing carbohydrate metabolism alone may be speculated about. In Addison's disease, however, and in a recent University of California patient with Simmond's disease (quoting Dr. Kinsell), when diabetes mellitus coexists, insulin sensitivity is great, but glycosuria and hyperglycemia persist. That all evidences of diabetes

ceased in this girl makes it unlikely that intercurrent adrenal or pituitary deficiency was responsible for the alteration in carbohydrate metabolism observed.

Liver disease may modify the expression of diabetes mellitus. Such may be considered first in terms of liver defect due to pancreatic defect and secondly independent of it. Fatty livers in experimental depancreatized animals may arise early and be corrected by insulin or late and require accessory lipotropic substances for correction. In the latter instance glycosuria is ameliorated during the progression of the fatty change and intensified by such a lipotropic agent as lipocaic. The amelioration does not, however, proceed to substitution by hypoglycemia. Fatty changes of the initial type, relieved by insulin, are the most common in man and would not be expected to occur in this well treated girl, nor indeed would hypoglycemia be expected if they did occur, judging from experience with animals.

Intercurrent liver disease of a grossly destructive sort is not indicated from the clinical record. Conn has spoken of hypoglycemia as a more or less isolated expression of liver disease. In Conn's experience with such an individual a glucose tolerance test done after a careful preparatory diet showed a low fasting blood sugar but hyperglycemia thereafter. This differs from the California data. It may be judged that liver disease is unlikely in our child but is not excluded beyond all shadow of doubt. We shall accordingly pass on to the probability that some change in the islets themselves is responsible for the emergence of hypoglycemia from diabetes.

When a diagnosis of hypoglycemia is established and that hypoglycemia is shown to occur in the fasting state, islet cell tumors are found in the great majority of cases. One may raise the question as to whether there is any good reason here for departing from this indication from percentage in favor of some rarer process such as hyperplasia of the islets. I am inclined to favor hyperplasia here for a somewhat theoretical reason. The islet defect in diabetes when it exists is diffuse and I should expect the recovery to be. It is so, you recall, in dogs made diabetic by pituitary extracts (Young's diabetes) when the experiment is not carried to the point of permanent injury. Such a consideration should not of course lead to any deterrence of the surgeon and the most painstaking search for a tumor must be prosecuted. Such tumors may be tucked up well behind the head of the pancreas and be difficult to find.

There does exist one very curious analogy with the process of hyperplasia that may have occurred here. These are a few instances of full blown exophthalmic goiter arising during the course of thyroid treatment and continuing after thyroid has been stopped. In these instances the usual suppressive action of a hormone on the gland of origin has been lost and some obscure compensating process has forced its way through this commonly effective physiological barrier. Some such process may have occurred here and I should con-

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sider it the likely answer although an islet cell tumor must be sought for and responsible liver defect is not impossible.

PATHOLOGIST'S DISCUSSION

DR. J. F. RINEHART*: This case is unique in my experience. I have seen nothing exactly corresponding to it, and I am not aware of a comparable case in the literature. The exploratory operation was quite thorough, including a careful search of the pancreas and entire gastrointestinal tract for an adenoma. If not found in the pancreas such tumors are found somewhere along the small intestine, or near the distal end of the pancreas adjacent to the spleen. In this case no such tumor was found. After some hesitancy on the part of the surgeon and internists concerned, a subtotal pancreatectomy was performed. There was a somewhat stormy postoperative course complicated by a partial intestinal obstruction, which was surgically relieved. Following this a pneumonia developed which was moderately severe, but the child recovered. The subsequent course indicates that the condition causing the hypoglycemia was relieved by the pancreatectomy because the child has again become diabetic to a degree somewhat less severe than originally.

I would like to show you a few slides prepared from this pancreas. First I would like to say that careful study of the pancreatic tissue removed did not reveal an adenoma or any abnormality that was grossly recognizable. The tissue was cut at intervals every two or three mm. and I feel

confident we have surveyed the pancreas very carefully.

Here [slide] is a section from this pancreas showing a small "normal" pancreatic islet. The islet illustrated here is really somewhat atrophied, the cells are rather small and they appear functionally relatively dormant. In this second slide [slide] we have something quite different. In the first place this structure illustrated is large, relatively to a normal islet. This is an abnormal "islet" and is representative of many such structures present in this pancreas. The cells and their arrangement have an appearance which is intermediate in character between islet and acinar tissue, and it appears to me that these abnormal islets have in fact arisen from the exocrine or acinar tissue rather than representing an hypertrophy of pre-existing islets. I assume that these abnormal islets were the functional tissue causing the hypoglycemia. This is, in fact, an assumption. However, the failure to find an adenoma and the fact that the pancreatectomy relieved the condition supports this conclusion. The child is now well except for a mild diabetes.

Now I would like to show slides to illustrate the more common findings. The adenoma illustrated here [slide] is the more usual finding in cases showing the clinical syndrome characterized by attacks of hypoglycemia. Islet adenomas are usually purplish-red nodules of tissue rarely over a centimeter or two in diameter and of the characteristic histologic pattern shown. Such tumors are usually benign; occasionally they are malignant.

I think Dr. Kenyon is to be congratulated for coming remarkably close to the facts in his discussion of this case.

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PENICILLIN SALVE FOR EYE INFECTION

Penicillin ointment is the most effective drug ever used for treating chronic inflammation of the eyelids and their membranous lining, according to Capt. Samuel H. Stein, Medical Corps, Army of the United States.

Captain Stein, writing in the current issue of the *Archives of Ophthalmology*, which is published by the American Medical Association, states that, judging from the results obtained after treating 25 patients with this

ointment, it "is more effective than drugs formerly used" in the treatment of this condition since it gives rapid relief from symptoms and clears the infection.

Only two cases failed to respond to this treatment, therefore the author suggests that these might not have been due to an infection but rather to an allergy. The staphylococci, which also are responsible for boils, were the infectious agents in this series of cases.



CLINICAL CONFERENCES

From the Ward Rounds of the Stanford University Surgical Service at the San Francisco County Hospital, June 28, 1946

Case Number 1. Presentation by house officer, Dr. James J. Hamilton: This 25-year-old Mexican woman, separated from her husband, was well until she fell down six steps on June 6, 1946. She struck her right side just below the rib margin. Bundles, weighing approximately ten pounds landed on the anterior abdominal wall. Right upper quadrant pain caused her to lie on the steps for several minutes. The pain was moderately severe and radiated across the upper abdomen. That afternoon she passed clotted, bloody, vaginal discharge. She entered the ward on June 7, complaining of pain and tenderness, nausea and vomiting and bloody vaginal discharge, all of about 12 hours' duration.

At physical examination the uterus was felt to be enlarged to the left. A fetal heart was heard at 128 beats per minute. There was tenderness over the entire abdomen, more marked in the right lower quadrant.

LABORATORY EXAMINATION

Urinalysis showed 4 plus acetone; no sugar; 4 to 8 white blood cells per high dry field; no red cells. The hemoglobin was 85 per cent; white blood count 22,000 with 93 per cent polymorphonuclear cells.

At 11 p.m., June 7, the tenderness was more marked, chiefly just to left of the umbilicus. The fetal heart was not heard. The cervix admitted one finger. There was marked tenderness in the culdesac not noticed on previous examination.

June 10, the fetal cord prolapsed. Labor was induced with Vorhees' bag. Delivery occurred early on morning of June 11. Vomiting and tenderness persisted. One June 13, the abdomen was distended, the stools were liquid, there was moderate edema of the chest and back. A Wangenstein suction tube was inserted. On June 18 she began to pass bile stained lochia. Jaundice developed and has persisted to the present date.

On June 24, aspiration taps made bilaterally in the lower abdomen showed fluid from which B.*coli* was recovered. Later the same day, exploratory laparotomy was done. An abscess of the entire peritoneal cavity was found. There was thick exudate throughout the abdomen. In post-operative blood studies the hemoglobin varied between 75 and 80 per cent and white count between 7,500 and 10,000.

DISCUSSION

Dr. Roy Cohn.* We still do not know the answer to this patient's problem. When first seen by the surgical service, three days after entry, she

was extremely ill, with signs and symptoms of generalized peritonitis. We presumed this to have been due to a ruptured viscus which occurred either at the time of injury or secondary to instrumentation. Because of the severity of her illness, the conservative treatment of generalized peritonitis was continued. She seemed to hold her own and gradually localized a large fluid collection in the anterior mid-belly, non-tender to palpation. At this time the patient began having frequent thin bowel movements as if an abscess had ruptured into the colon. With great care the left side of the abdominal fluid collection was aspirated. The same type of fluid that the patient was passing by rectum was obtained. It became obvious that this fluid collection was actually an abscess and not a collection of bile.

Using local anesthesia, the abdomen was opened over the abscess and a large abscess filled with thin brownish B.*coli* fluid was evacuated. The walls were made up of the intestines which were matted together. The pelvic viscera were covered with fibrin but otherwise appeared normal. No source for the abscess was noted.

Since operation, the patient has been improving. Her temperature has fallen and we have been able to remove the nasal suction for the first time. It is possible that her jaundice was only a toxic hepatitis.

Dr. C. Mathewson.** It is very difficult to put this whole picture together, particularly in view of the bile in the lochia and stool and the progressive jaundice. Certainly we may rule out obstructive jaundice. A fall causing sudden compression of the abdomen may result in rupture of the bowel in that portion which contains gas, or the bowel may tear at its peritoneal attachments. Looking back, now that we know that this patient did have an intra-abdominal abscess, it is possible to account for the picture on the basis of a rupture of the liver associated with a rupture of the bowel. She put out large amounts of bile in the stool and lochia and also became progressively more jaundiced.

It is rare to see a patient who has just had an abortion, at which time the uterus is wide open and draining, and one who at the same time has a rupture of the liver and bowel with a free flow of bile into the peritoneal cavity. Assuming that such is true in this case, the appearance of free bile in the lochia and stool is not difficult to explain.

Has she a communication between the bowel, the abscess and the abdominal wound? When I

* Roy Cohn, M.D., Acting Assistant Professor of Surgery, Stanford University School of Medicine.

** C. Mathewson, M.D., Acting Professor of Surgery, Stanford University School of Medicine.

saw her the abdominal wound was draining pure bile with little or no fecal content. If there is a fistula in the bowel, and we must assume that there was in the beginning, it is closing over. Continuity of the bowel has been re-established because she is no longer vomiting, is holding down fluids, passing gas and having regular bowel movements. In the immediate future we should watch carefully to see if she has direct communication between the peritoneal cavity and the liver. Now that she is draining bile freely to the outside, the jaundice should clear up rapidly.

Should an abdominal therapeutic abortion have been done? In retrospect, yes. Assuming that she is suffering with a ruptured bowel and liver, early exploration of the abdomen with proper repair might well have avoided the complications which have developed.

Follow-up note: This patient died suddenly on the evening of June 28. At autopsy it was found that the abscess of the peritoneal cavity was the result of a laceration of the terminal ileum. A second, much smaller perforation was found in the sigmoid colon. This was thought to be secondary to rupture of abscess. There was a toxic hepatitis. The jaundice and the yellow color of the lochia were the result of this. There was no communication between the biliary passages and the peritoneum. A few small pulmonary infarcts were found. These were not considered sufficient to be the cause of sudden death. A satisfactory pathological cause was not evident.

Case Number 2. Presentation by house officer, Dr. Hamilton: A 57-year-old woman entered Mission Emergency Hospital after 70 hours of severe lower abdominal aching and intermittent cramping with nausea and vomiting. She has had no bowel movement since before the onset of symptoms.

Family history is not relevant.

The past history is important in relation to the present illness. In 1913 a left ovarian cyst and the appendix were removed. In 1919 a hernia was repaired. In 1921 she was hospitalized six weeks for strangulation of the bowel. In 1923 she had a second bowel obstruction. She has had known diabetes for the last ten years. She took 30 units of insulin once a day. The fasting blood sugar level was about 150 mg. per cent. Urine tests for sugar done by the patient were usually yellow. On admission 100 units of regular insulin were given.

Flat film shows dilated loops of small bowel. Laparotomy was done and the obstruction relieved. Since operation the course has been uneventful. There has been no recurrence of obstruction. Within 12 hours following operation, 155 units of regular insulin were given. For maintenance she has had regular insulin, 10 units

at noon, and protamine zinc insulin, 30 units at 6:30 P.M. The fasting blood is 129 mg. per 100 cc. of blood.

DISCUSSION

Dr. B. L. Halter:† This patient had been operated on several times. There was a history of chronic bowel obstruction. We were reluctant to treat her conservatively because of the additional problem of diabetes. The use of a Miller-Abbott tube means much wear and tear on the patient and the surgeon, under the best conditions. Because of her severe diabetes it seemed best to get her in proper condition as rapidly as possible and to relieve the obstruction surgically. No person should be denied surgery because of diabetes. In elective cases the diabetes should be primary and the surgery secondary. If the patient is free of acetone, one does not have to worry too much about postoperative complications. The question of the type of anesthesia is important. It is generally believed that any anesthetic can be used. We prefer to use local whenever possible. The difficulty in controlling the diabetes is not completely eliminated at present but is less than it would have been had we tried to treat her conservatively.

Dr. C. Mathewson: I am not in a position to be critical of the judgment used in this case. Generally speaking, a person who has had previous operations for bowel obstruction is a good candidate for subsequent attacks. Once you release the adhesions within the abdomen by surgical means, you may expect new ones to form. It is best to treat this type of recurrent obstruction conservatively whenever possible. However, one must always keep in mind the possibility of strangulation. Such a patient must be kept under constant and careful observation. If the obstruction is not quickly relieved or if there are any signs of localized peritonitis, operation should be performed immediately. Once strangulation has taken place the prognosis is bad unless relieved at once. This patient presented a different problem because of the diabetes. She would have been treated conservatively had it not been for the complicating disease. The fluid loss is often great with the Miller-Abbott tube. This makes control of the diabetes difficult. Surgical relief of the obstruction in this case has met the immediate problem but does not influence the possibilities of future attacks.

Follow-up note: The postoperative recovery of this patient was uneventful. She went home with the diabetes controlled.

† B. L. Halter, M.D., Clinical Instructor of Surgery, Stanford University School of Medicine.



MEDICAL PROGRESS

PENDLETON TOMPKINS, M.D., *San Francisco*

Current Methods for the Study and Treatment of Sterility

THE principal causes of infertility in the female are pelvic neoplasms, abnormalities of cervical function, occlusion of the fallopian tubes, faulty ovulation, hypothyroidism, pituitary-ovarian imbalance, states of lowered general vitality and failure to have intercourse at the time of ovulation.

Pelvic neoplasms such as polyps, large fibroids, and adnexal cysts usually require removal to ensure the best chance of a successful pregnancy. Major surgery should not be undertaken solely for the purpose of furthering conception until the fertility of the husband has been established.

Disorders of cervical function constitute one of the major problems in the treatment of sterility today. Only recently has attention been given to the normal physiology of the cervix. Pommerenke,¹ among others, has shown that the volume of cervical mucus increases three or four fold just prior to ovulation, then decreases. It is also known that during the phase of ovulation sperm are able to penetrate mucus more readily. It is therefore important to secure and maintain a free flow of normal mucus. Since simple cervical erosions are believed to result from excessive excretion of cervical mucus it seems unlikely that erosions interfere with fertility. So many obstetric patients are found to have small erosions when they are examined for the first time in pregnancy that one begins to wonder whether simple erosions actually promote conception.

ENDOCERVICITIS A MAJOR PROBLEM

Endocervicitis is quite another matter, for infection alters the chemical and physical character of the mucus and by blocking the cervical glands interferes with its production. Hence endocervicitis is a major problem. The usual gynecologic treatment by endocervical resection or "conization" is quite satisfactory in ordinary practice but must be employed with discretion and restraint in treating sterility. If most or all of the infected cervical glands are removed by too radical a resection the remaining secretory tissue may be insufficient to provide a normal supply of mucus. Conversely, inadequate removal of the infected tissue leaves an unhealthy cervix.

Treatment by medicated tampons is both theoretically and practically futile and is obsolete. Intracervical installation of sulfa compounds or insertions of wicks impregnated with penicillin may occasionally be successful. Improving cervical drainage by thorough dilatation and by removing synechia and pockets with the cervical curette is well worth while. The use of a Wylie drain held in place for a month or so by a suture is returning to favor. This is particularly valuable when the cervical canal is sharply bent by an acute anteflexion or retroflexion of the uterus. No

doubt the dilatation and curettage which accompany insertion of the drain are responsible for part of its apparent effectiveness. Hot douches have little effect upon endocervicitis; Elliott treatments (a vaginal balloon through which hot water is circulated under constant temperature control) and diathermy are somewhat better. These three forms of thermal therapy increase the blood supply, they have no specific action.

STIMULATION OF CERVICAL MUCUS

Abarbanel,² and Pommerenke³ have shown that normal cervical mucus can be produced in castrate patients by the administration of estrogens. It would therefore be reasonable to try to improve the mucus flow in this way. A deterrent consideration is the possibility of producing an endocrine imbalance in a patient whose prospect of successful conception is dependent upon perfect endocrine function. No doubt we shall hear more about stimulation of cervical mucus by endocrine therapy in the next year or so.

Formerly the usual post-coital test consisted in a microscopic examination of a sample of semen from the vaginal pool. This type of examination, which demonstrated the presence of sperm but gave no accurate information about their number, morphology or function, has been abandoned by all advanced workers. The present-day post-coital examination consists in a study of the cervical mucus four to six hours after intercourse *at the time of ovulation*. As pointed out above, the cervical mucus is normally most profuse and most receptive to sperm during ovulation. For this reason post-coital examinations are made *only* during this phase of the cycle. In arranging for the test the physician predetermines as best he can the date of ovulation and makes an appointment for his patient on the proper day. The technique of the test is simple: a sample of mucus is secured by aspiration or by inserting the closed tips of a pair of thumb forceps high into the cervical canal. Normally a large clear "gob" of mucus is secured. Examination under the high dry lens should show ten or more active sperm per field.

FINDINGS FROM STUDY OF CERVICAL MUCUS

Study of cervical mucus has yielded several interesting findings. The number of leucocytes in the mucus proves to be a much better index of the degree of endocervicitis than simple inspection of the cervix. It is found that sperm readily gain access to the cervical canal regardless of the position of the uterus. Thus retroversion does not cause infertility by making the cervix inaccessible to sperm. The rapidity with which sperm reach the cervix during or after intercourse and the speed with which they progress upward in the cervical canal make one extremely skeptical of

the alleged value of post-coital contraceptive douches.

Michelson⁴ analyzed a series of post-coital examinations and found that if three specimens of mucus are taken from the same patient, one near the external os, one in mid-canal, and one near the internal os, the lowest specimen will show the smallest number, the highest specimen the greatest number of active sperm.

One of the more recondite studies of mucus is the "sperm penetration test." This is accomplished by placing a droplet of ovulation mucus adjacent to a droplet of the husband's semen. Microscopic examination of the junction of the two fluids will normally show the sperm advancing into the mucus in a "flying wedge" formation. If the mucus repels the sperm they will batter at the junction without entering. This constitutes a negative sperm penetration test, presumably indicative of abnormal mucus.

All tests involving cervical mucus and sperm are assumed to have been made within 48 hours of ovulation. Office appointments are scheduled with this intent, yet it may be impossible to be certain, at the time of the test, that the proper day was chosen. Therefore it is essential to re-evaluate the findings two weeks or so later, after menstruation has occurred. By counting back 14 days from the onset of menstruation one determines the approximate date of ovulation. The finding of an occasional sperm on the 14th day before ovulation would be regarded as abnormal, but if the same finding were made on, say, the 19th day, no significance would be attached for at that time the mucus would not be particularly hospitable.

TUBAL OBSTRUCTION

Tubal obstruction is an old problem easily diagnosed by the Rubin test and confirmed by uterosalpingography. Occasional cases of occlusion are relieved by repeated insufflation and courses of diathermy. Salpingostomy may be attempted but only after the patient clearly understands that the chance of success ordinarily does not exceed 20 per cent.

Most of us automatically think of gonorrhea as the etiologic agent in tubal occlusion. There are other factors: tuberculous salpingitis (Sharmann⁵ found pelvic tuberculosis in 5 per cent of 840 sterile women), brucellosis, pneumococcus, pelvic inflammatory disease,⁶ pelvic peritonitis associated with appendicitis, peritubal adhesions after pelvic surgery, endometrial transplants, and, contrary to most texts, tubal infection following abortions, especially criminal abortions.

Faulty ovulation is a loose term used to describe cases in which conception fails to occur although the endometrial biopsy shows secretory endometrium, the temperature graph shows a fair "ovulation shift" and all other factors are normal as far as can be ascertained. Such patients may go along month after month, then, for no ascribable reason, conceive. One develops the impression that the release of a normal fertilizable ovum does not occur during every cycle in these pa-

tients. The work of Farris⁷ supports this idea, for by means of his new test for ovulation he has been able to predict correctly the cycles in which patients would and the cycles in which they would not conceive. It is probable that within a few years methods for estimating the character or quality of ovulation will prove that conception often fails not for lack of ovulation but because the mechanism of ovulation is imperfect or because an imperfect ovum is extruded.

HYPOTHYROIDISM

Hypothyroidism is the one endocrine disorder associated with sterility which is commonly found, correctly diagnosed and satisfactorily treated. The efficacy of thyroid substance reaffirms our often waning faith in endocrine therapy. It works. Basal metabolism tests should be taken on every couple, man as well as wife. If there is no contraindication, thyroid is administered whenever the rate is below zero; best results are obtained when the metabolic rate is raised to plus five or plus ten.

Pituitary-ovarian imbalance results in irregular periods, amenorrhea or infertility. Diagnosis is made by basal temperature curves, endometrial biopsy, vaginal smears and hormone assays. There is no generally accepted standard treatment whether on the ovarian level with estrogens and progestin, or on the pituitary level with gonadotropins. Many schedules of therapy are proposed, used, applauded and forgotten. One learns to beware of enthusiasm. X-ray treatment of the pituitary and ovary (Mazer's⁸ technique) is successful in some cases of amenorrhea and sterility. That brilliant results have followed its use is without question. There have also been instances of permanent amenorrhea subsequent to treatment. I have seen three.

States of lowered general vitality deserve much thought and effort, and seldom receive it. Fresh air, adequate sport, rest, relaxation, good food, happiness, these are bound to contribute to health and fertility. As Curtis so wisely says in his Textbook of Gynecology, the fertility of animals is immediately reduced upon caging them and too many humans are caged in tight apartments and offices. Others are in psychic cages. We are just beginning to hear discussions of the influence of psychic states upon fertility.

BASAL BODY TEMPERATURE GRAPH

Failure to synchronize coitus with ovulation is a surprisingly frequent cause of infertility. It must be remembered that the ovum is believed to be susceptible to fertilization for only 12 or 24 hours and that the fertility of sperm is not certainly longer than this, so there can only be a short period of 24 to 48 hours during the month when fertilization is possible. This period, the time of ovulation, can be determined fairly accurately by the calendar if the patient has reasonably consistent intervals between periods. But if the intermenstrual intervals varies markedly from cycle to cycle the predetermination of the date of ovulation is almost impossible. In such cases the

basal body temperature graph is indispensable. The graph is plotted by recording the oral temperature taken upon waking each morning. If the temperature graph is to achieve its maximum usefulness it should be recorded by, and its purpose completely comprehended by, the patient. This is greatly facilitated if the patient is supplied with written instructions and a suitable chart for recording her temperatures. Several varieties of forms are available from commercial houses.* These contain both instructions and illustrative sample graphs. (Figure 1.)

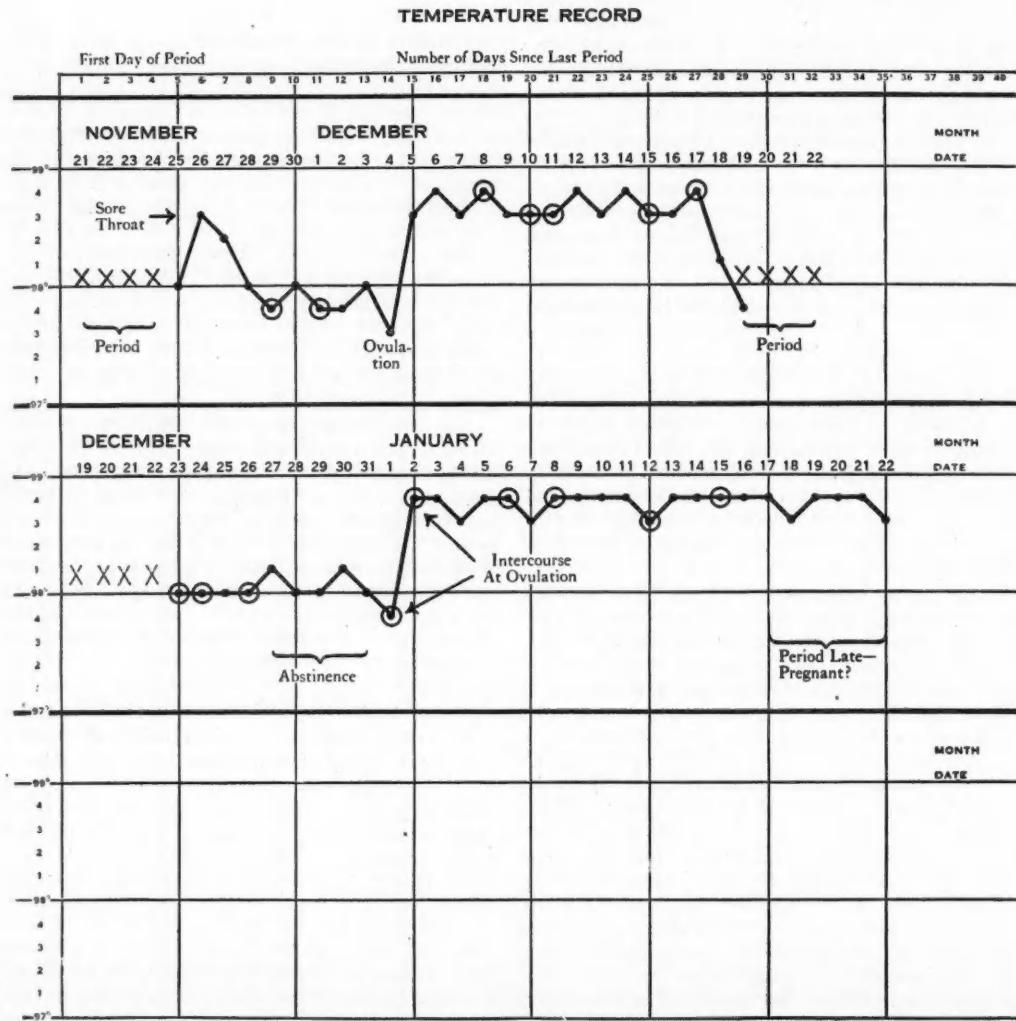
The typical normal basal temperature graph for an ovulatory cycle is "biphasic," that is, there is a low temperature level before ovulation and a

higher temperature level afterward, the shift in temperature occurring close to the time of ovulation. Since the optimum time for conception is during ovulation, the temperature graph serves as a signal. The many uses of these graphs have been discussed in full detail by Greulich,⁹ Martin,¹⁰ Davis,¹¹ and Tompkins.^{12, 13, 14, 15}

During an anovulatory cycle the temperature is flat, or "monophasic." An endometrial biopsy taken prior to uterine bleeding will show proliferative rather than secretory endometrium, thus confirming the absence of ovulation. In such a cycle conception is, of course, impossible.

One of the advantages of employing graphs is that the physician is able to determine not only whether ovulation occurred but also whether intercourse took place close enough to the time of ovulation to make conception theoretically possible. From the therapeutic standpoint faulty tim-

* My own preference is for the charts supplied gratis by the Ortho Pharmaceutical Corporation, Linden, New Jersey.



ing is tantamount to abstinence, since in neither case is there an opportunity for the sperm to meet the ovum. The treatment is proper instruction, not medication. Two additional uses of the basal temperature graph require mention. If the high postovulatory temperature level is maintained for 18 days or more it is reasonably certain that the patient is pregnant. One can then calculate the date of confinement by adding 266 days (38 weeks) to the date of the temperature shift.¹⁵ This is particularly helpful in cases where the intermenstrual interval is protracted, for in such circumstances the usual calculation of the term date by adding 280 days to the date of the last period will be erroneous.

INVESTIGATION OF MALE STERILITY

Investigation of male sterility requires an accurate sperm count. The most acceptable specimen is one which is collected in a clean glass container by masturbation. Condom specimens are unsatisfactory for two reasons; chemicals in the rubber or in the talc devitalize some of the sperm and an indeterminate number of sperm adhere to the phallus. Withdrawal specimens are also unreliable. Fractional counts show that as many as 75 per cent of the total number of sperm may be contained in the first one-third of the ejaculate. If any of the specimen is lost before withdrawal, as frequently happens, it will be the first portion which contains most of the sperm. Therefore all students of male infertility are agreed upon the necessity of masturbation specimens for accurate counts.

There are two unpardonable errors in advising male patients. The first is to glance at a specimen of semen under the microscope, observe myriads of sperm and, without making a count, to assure the patient that he is "perfectly normal." Just as the hematologist requires both a leucocyte count and a differential count before reaching a conclusion, the investigator of sterility must make a sperm count, a differential count and a test of the duration of motility of the sperm. Not until at least two specimens have been studied is an opinion justified. Normal specimens contain 100 million or more sperm per cubic centimeter of which 80 per cent are morphologically normal. A count of less than 60 million indicates relative infertility, the degree of fertility being roughly proportional to the count. Complete absence of sperm in the semen (azoospermia) usually means vaso-epididymal occlusion. Testicular biopsy, a simple procedure requiring only a few hours' hospitalization, will differentiate between failure of spermatogenesis and occlusion. Biopsies are being relied upon more and more for accurate appraisal of the degree of infertility and for prognosis.

The treatment of oligospermia is discouraging. During the recent meeting of the Society for the Study of Sterility I asked seven prominent students of male sterility whether they knew of any treatment of oligospermia which was of proven value. Six members of the Society answered

flatly, "No"; the seventh said that he hoped to have something to report in a year or two. On one point all were agreed; that administration of testosterone lowers the sperm count. Although there is no certain method of successfully treating oligospermia, azoospermia due to obstruction may be relieved. Michelson¹⁶ has developed a new technique for vaso-epididymal anastomosis in which he produces a permanent vaso-epididymal fistula by means of a stainless steel wire. Charny of Philadelphia has reestablished potency in some cases by flushing out the vas. The brilliant results which are sometimes obtained by urologists specifically interested in the treatment of male infertility must be kept in mind. As pointed out above, it is wrong to make a diagnosis of normal fertility without a complete sperm count. Conversely, it is equally poor practice to commit oneself to a diagnosis of hopeless sterility without first securing the opinion, in consultation, of a urologist who has trained himself in the investigation and treatment of male infertility.

This summary will be closed with a word about results. More than 40 per cent of women who apply for treatment of infertility subsequently bear children. Before taking to ourselves too much credit for this happy outcome we should remember that conception is normally to be expected, that time alone is a great healer, that thousands of women conceive after years of barrenness without treatment and that no "control series" are available in sterility studies which enable us fairly to appraise our results. Nor should our critical evaluation of treatment be biased by the praise of patients whose gratitude so often leads them to give us more credit than we deserve. We can best preserve our intellectual honesty and maintain a scientific balance by remembering the example set by Ambrose Pare who brushed aside praise with the immortal reply, "I dress the wounds, God heals them."

490 Post Street.

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INDUSTRIAL REHABILITATION CENTER IN BRITAIN SUCCESSFUL

A British industrial psychiatrist describes the successful work of England's first industrial Rehabilitation Center, which treats patients suffering from occupational and social maladjustments, in the current issue of *Hygeia*, health magazine of the American Medical Association.

Thomas Ling, M.D., who has been Medical Director of Roffey Park Rehabilitation Center since its opening, says that "during one 12 month period 580 men and 460 women have been treated with satisfactory results. Many of the cases were medically and psychiatrically difficult and a minority were complicated by insoluble social problems. It is often difficult to classify the cases exactly, but the greater number were suffering from occupational and social maladjustments."

Rehabilitation, the author explains, is a form of scientific treatment which should be a part of medical therapy of all illnesses. The better and earlier the treatment, the fewer will be the cases of permanent disability which will require vocational training and the more satisfactory the results in those so trained.

Roffey Park operates in the following way, according to Dr. Ling:

"The Center provides residential facilities for 100 patients of both sexes between the ages of 18 and 50 years. Priority of admission is given to employees of subscribing firms although admission is not limited to patients from such sources.

"Each patient is given a thorough examination and psychiatric interview, together with appropriate intelligence and aptitude tests. The patient is also interviewed by the social worker who has had wide industrial experience.

"Emphasis is placed on the treatment of each case with physical, occupational and psychologic features receiving due attention. Occupations for men consist of engineering workshops, woodwork, wood-sawing and gardening.

Women's occupations consist of domestic work, needle-work classes, gardening, art classes, assisting in the nursery (established on the premises for children of the staff) and training in elementary dietetics. Unless there are medical contraindications, each patient carries out a daily graded course of physical training.

"Three resident psychiatrists and visiting specialists are available. Patients are seen by the doctor in charge at least twice a week and more often if necessary. Problems in the patient's life are discussed and help is given toward eradicating them. In some instances difficulties have arisen at work, in others at home. In others the problems may be of a more deep-seated nature. A full understanding of the patient's working background is essential and close contact is kept with the office or factory from which the patient has been sent.

"Each evening a communal activity, including discussion groups, gramophone recitals, amateur theatricals, motion picture shows and dances, is arranged for the patients.

"Patients remain for an average period of six weeks. Before discharge careful attention is given to subsequent placement at work. The majority of the patients are able to return to their normal employment, but some present a problem in placement. To help in this work, Britain's Ministry of Labor officials visit the Center each week."

The author emphasizes the fact that Roffey Park has proved a first-class success since its establishment in 1943. A sum of approximately \$300,000 was subscribed from industry at that time and a large country house, 30 miles from London in Horsham, Sussex, was purchased. It is maintained by a number of leading employers in the country. Dr. Ling hopes that "industry will sponsor additional centers in the future and, ideally, there should be at least one such hospital outside each big city, linked up with the main industries of the district."

CALIFORNIA MEDICAL ASSOCIATION

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FOR COMPLETE ROSTER OF OFFICERS, SEE ADVERTISING PAGE 2

NOTICES AND REPORTS

Program of the Cancer Commission

LYELL C. KINNEY, M.D.,* San Diego

DURING the April campaign of the American Cancer Society \$770,000 was contributed in California. Forty per cent of that contribution will be sent to the National Headquarters for cancer research. The members of the Cancer Commission must share with the other members of the state board of directors the responsibility of seeing that the remaining 60 per cent of the public funds is spent wisely and most effectively in cancer control projects and for statewide service to cancer patients.

In spite of the splendid work now being done by physicians in the treatment of cancer, the death rate from this disease in California is still 1,000 each month and we as physicians can effectively lower that mortality.

The educational program of the Commission aims to bring forcibly to all physicians the new facts concerning diagnosis and treatment of cancer, to make the physician more cancer-conscious and to stimulate a sustained program of regular periodic physical examinations to detect early cancer in private practice.

The Commission is preparing a three-fold educational program. With the generous cooperation of the faculties of the medical schools in Los Angeles and San Francisco, short refresher courses in cancer will be offered for the physician. These courses will be subsidized by the American Cancer Society so that they can be well organized and given free, without additional expense to the medical schools. The members of the Commission will assist in arranging the program of these refresher courses and will keep the profession fully informed about these opportunities.

In order to bring cancer education to the physicians, the Commission is preparing a panel of speakers and programs on cancer that will be available to the county medical societies. The extent of these programs will be suited to the needs

and wishes of the county societies. They may be for a single medical society meeting, or they may be extended to a Cancer Day including symposia, clinical demonstrations and a public meeting on cancer. After the program is established it is planned to offer short refresher courses on cancer in strategic locations throughout the state where they are requested by the county medical society or a group of county societies.

The Commission is now preparing a cancer manual to be distributed to the members of the California Medical Association. This will be the first revision of the pioneer Cancer Studies prepared by the Commission in 1934. The manual will be published in serial bulletins that can be bound in a loose-leaf folder for reference in order to keep the information up-to-date and to make a continuing educational program. This manual, which is a major task, is in the hands of an editorial committee consisting of Doctors L. G. Dobson, C. J. Berne and Otto Pflueger.

The Commission is also preparing to keep in close touch with the cancer clinics throughout the state. The members of the Commission and its executive secretary will be ready to advise and plan with cancer clinics, particularly those that are receiving subsidy from the American Cancer Society. Also, the Commission will be prepared to assist and advise in organizing new cancer clinics where they are feasible and where an adequate staff is available. In order to assist new clinics to organize and to obtain financial support, the Commission has prepared minimum standards for approval at the state level.

Detection clinics for the examination of well persons to discover early cancer or early chronic disease are becoming an important factor in the national public health program. There will be an increasing public demand for such clinics. Foreseeing this need, the Cancer Commission is prepared to assist any county medical society to plan and establish detection clinics at their request.

The Commission is prepared to cooperate with

* Chairman of the Cancer Commission.

the county medical society and the State Department of Public Health in conducting a cancer survey in any county in the state. The Council of the Los Angeles County Medical Society has approved a cancer survey in that county in which the Cancer Commission will take an active part.

The local problems in cancer control are necessarily the responsibility of the county medical society and indicate the appointment of a strong cancer committee consisting of members interested and experienced in cancer. The Commission and its executive secretary will be ready to advise with the county cancer committees and to assist them in working out their local problems.

A central tumor registry for California is essential for correlating and evaluating the diagnosis and treatment of cancer in this state. The Commission has undertaken to develop this central tumor registry and has the assurance of the cooperation of the California Department of Public Health in this project.

In addition to these official activities of the Commission, the members as individuals are taking active part in the California division of the American Cancer Society. The California division is a voluntary public health corporation representing the work of the American Cancer Society and its Field Army. Both at the state level and in the chartered county branches the administration of the Society is in the hands of boards of directors. At both levels the Cancer Society is enlisting outstanding business men, community leaders in education, health and public welfare, as well as the medical profession to participate in the work and serve on the directing boards.

The members of the Cancer Commission are automatically, through the by-laws, included in the board of directors of the California division. On the county level the members of the Cancer Committee of the county medical society are members of the board of directors of the county branch. It is the national policy as well as that of the California division that all medical policies shall be determined and supervised by physicians.

The primary objectives of the American Cancer Society in California are the education of the public in cancer, service to cancer patients, subsidizing cancer facilities and raising funds for these objectives on the state level and for cancer research on the national level.

In every public health program, whether it be venereal disease, tuberculosis or cancer, the most important weapon is education of the public. With the slogan "Much Early Cancer Is Curable" the Society will conduct a statewide educational program to acquaint the public with the danger signs that may mean cancer and impress the need for immediate examination and treatment when these signs are present. Also, the public is being educated in the need for periodic health examinations to discover cancer while it is early and curable. In the larger cities educational centers are being set up as a clearing house for educa-

tional projects and to which the public may go with their suspicions and problems and receive proper direction. Cancer literature is being widely distributed and this will include literature in Spanish and other foreign languages. The educational program includes speakers for lay meetings and a public school program in the departments of biology and hygiene.

The service program of the American Cancer Society is directed to provide better facilities for the diagnosis and treatment of cancer. Funds are available to provide increased facilities in existing cancer clinics. Financial assistance will be given in the establishment of new clinics to provide personnel, instruments and supplies and for follow-up service. Similar support will be given to approved detection clinics when they are organized. The service program also includes payment for free or part-time beds and special examinations for needy cancer patients. Provision can also be made for home nursing, surgical supplies and transportation for needy patients. Where it is possible to obtain them the California division will subsidize hospital beds for advanced cancer patients.

The ultimate success of the entire cancer control program depends upon the cooperation and support of the medical profession. The Cancer Committee in each county medical society should be the leader in that cooperation. To this end the members of the Cancer Committee should be men and women who will take an active interest in the cancer program and work on the board of directors and executive committees of the county branches of the American Cancer Society.

The American Cancer Society will spread information and publicity about cancer and will refer inquiring patients to the county medical society. However, this will be rather futile unless there are physicians in each county who are willing to accept these patients for prompt examination and diagnosis and who will see that they receive immediate effective treatment. Some of the referred patients in the lower income groups must be sent to tax-supported hospitals and clinics for treatment, but the local Cancer Committee should work out a general referral system to save public confusion and to obtain prompt action. The San Francisco County Medical Society is preparing a panel of physicians who will accept cancer cases. This program is acceptable to the county medical society and should be welcomed by the public.

The lay educational program of the Cancer Society presupposes a group of physician-speakers in each county who will talk on cancer to lay groups when requested. The selection and maintenance of such a speakers' bureau is a necessary function of the Medical Society's Cancer Committee. The Committee can also interest itself and the Medical Society in detection clinics or cancer clinics when they are feasible and secure the participation of physicians in these facilities. The Committee can evaluate the financial support necessary for these cancer projects and secure re-

quired funds for them through the county branch of the Cancer Society.

The public is cancer-conscious and is willing to contribute funds to the cancer program, but they will only do so as long as that program is effective. The maintenance of an active cancer service program in each county is essential and this can be done only with the leadership and continued cooperation of the local medical profession.

While the work of the Cancer Commission of the California Medical Association will be largely

at the state level, the members of the Commission and the executive secretary will be prepared to work with the Cancer Committee of each county medical society and cooperate with them as they may request. The Commission will conduct an educational program for physicians, they will try to increase cancer facilities in the state and they will endeavor to assist the medical profession in their relation to the cancer control program. The Commission will cooperate as fully as possible with the American Cancer Society and the California Department of Public Health.

1831 Fourth Avenue.

DR. McCARTHY NAMED EXECUTIVE MEDICAL DIRECTOR OF CANCER COMMISSION

William D. McCarthy, M.D., of Oakland, was appointed Executive Medical Director of the Cancer Commission of the California Medical Association on July 22. Dr. McCarthy will also serve as Chairman of the Educational Committee of the American Cancer Society, California Division.

This appointment fills an urgent need in making it possible to carry out the far reaching service and educational projects of the American Cancer Society, California Division, which are coordinated with activities of the Cancer Commission. The Executive Medical Director will assist the standing committees of the Commission, initiate and conduct a cancer survey of the State of California, visit the various County Medical Societies to assist in arranging their cancer programs, and collaborate with the American Cancer Society. Part of Dr. Mc-

Carthy's duties will be to investigate and aid existing cancer clinics, as well as to assist in the formation of new clinics.

Dr. McCarthy is well qualified for the position of Executive Medical Director. He received his M.D. degree from Cornell University Medical College in 1935. Post-graduate training includes an internship at the Jersey City Hospital, surgical residency at Bellevue Hospital, a fellowship in cancer at Memorial Hospital, and a surgical fellowship at the Lahey Clinic. A few months before the United States entered the war, Dr. McCarthy established private practice in Oakland, and became the Associate Director of the Alameda County Tumor Clinic. During his tour of active duty in the Navy, he was one of the prime organizers of the Tumor Clinic at the U. S. Naval Hospital, Oakland.

New Industrial Medicine Fee Schedule

New fees for industrial medical and surgical cases will be put into effect in the near future. This good news came from the Industrial Accident Commission of the State of California following its meeting of June 18.

The new fee schedule contains about 535 items and goes into enough detail to enable any physician to determine the exact fee which is due him for services performed on compensation cases. This replaces the old 1920 fee schedule of the Industrial Accident Commission, a schedule which covered only about 87 items.

In acting on the new schedule the Industrial Accident Commission approved a compromise schedule based on the original request of the California Medical Association presented to the Commission in December, 1942. Since the first presentation, the Commission has held one public hearing, two interim committees of the Assembly have taken testimony on the inadequacy of compensation fees for medicine and surgery and a special study committee appointed by the Industrial Accident Commission has held numerous meetings. The net result of all this consideration was a compromise by the Commission's special study committee, the compromise recognizing the fairness of most of the surgical fees requested by the C.M.A. but reducing the fees for office, hospital and home visits.

As adopted by the Commission, the new schedule represents about a 25 per cent increase in the fees for surgical procedures and an increase of from 20 to 30 per cent

in the fees for visits. Largest increase in the visit fees was in the case of office visits subsequent to the first visit; in this case the Commission increased the old fee of \$1.25 to \$2.00.

Just what overall percentage increase over the old fees is represented by the new schedule has not yet been officially determined. One insurance carrier has estimated an overall increase of 40 per cent but this figure may be open to question.

All C.M.A. members will be provided with a copy of the new schedule of fees just as soon as the Industrial Accident Commission has set the effective date for these fees. This is now expected to be around September first. *Meanwhile, compensation fees in effect are the old fees plus the fifteen per cent surcharge which has been in effect for the past two years.* The surcharge will be removed when the new fee schedule goes into effect.

Members are requested to put the new fees into use just as soon as the effective date is announced and new copies of the schedule are distributed. Members are also cautioned against the attempts which may be made by some insurance carriers to discount from the new fees or to solicit the care of compensation cases at a percentage off the new fee schedule. Undoubtedly some such attempts will be made. The California Medical Association has put itself on record as being unalterably opposed to such practices and has met the threat of such tactics by announcing that it stands ready to take any fee dis-

putes before the Industrial Accident Commission. The Commission is authorized by law to establish fair medical and surgical fees in cases where such fees are in dispute; in such cases the Commission relies upon the schedule of fees which it has officially adopted. Accordingly, there is no need for any C.M.A. member to submit to a reduction of the officially adopted fees.

Provision will be made in the fee schedules which are sent to our members to notify them of their rights in cases of disputed fees and to provide for the proper reporting of such cases. The C.M.A. stands ready to furnish legal representation and to prosecute all such cases before either the Los Angeles or San Francisco offices of the Industrial Accident Commission.

It is hoped that fee disputes in compensation cases will be kept at a minimum number. However, where they do arise they should be promptly and adequately handled so that the physicians rendering services under the com-

pensation laws may not be deprived of their rightful fees. It is believed that the large majority of insurance carriers will accept the new fee schedule without question, particularly since it represents the Commission's official action on a schedule presented by a study committee which the insurance companies themselves suggested and on which the insurance companies had some eight representatives and the C.M.A. only one.

Watch for your copy of the new schedule. It will be sent to you as soon as the effective date of the schedule is determined and new copies printed. Your secretary will want to keep this schedule in her desk for the billing of compensation cases and the schedule will be prepared in a form suitable for this purpose.

When the new fees do go into effect they will represent the culmination of three and one-half years of effort by the C.M.A. to bring up to date and to make more complete the old 1920 schedule.

CALIFORNIA PHYSICIANS' SERVICE—MEMBERSHIP DRIVE

Propelled by an intensive sales effort and stimulated with precedent-shattering advertising campaigns over the air and in the newspapers, enrollment in the California Physicians' Service, this month, passed the quarter million mark. An all-time high—251,246 persons now enjoy its protection.

June and July broke all enrollment records when a total of 51,919 Californians became members of their "own family physician's plan" for prepaid low cost, medical, hospital and surgical care.

This exceptional growth can be more readily appreciated when it is noted that as of August 1 of this year C.P.S.'s membership totalled nearly 100,000 more than one year ago.

Physician membership has kept pace with this phenomenal enrollment increase.

During the past 12 months, 1,584 of California's professional men have become associated with C.P.S., bringing the August 1946 total to 7,155.

This hand-in-hand growth augurs well for greater accomplishments in the months to come.

C.P.S. representatives attribute no small part of their recent success to the participation in the Voluntary Health Insurance Weeks conducted by the California Committee for Voluntary Health Insurance. C.P.S.'s part of the campaign is to run the California Medical Association-sponsored advertising in every paper, both weeklies and dailies, in the County, and to participate in the publicity built around the local County Medical Society.

During these weeks dual dividends are developed.

The immediate result, the one you can touch and feel and count—is an increase in memberships in the community where the Health Week event is being conducted.

The second result, immeasurable though it may be for the moment, is better public relations for the entire medical profession.

Here—no magic wand can be waved to accomplish miracles. Miracles are no more easily accomplished in the field of public relations than they are in any other profession.

However, where the local physicians give more than mere lip service in the preparation for and the conduct of the Health Week exceptional dividends have resulted.

The preliminary plans for Health Week are designed to put the local physicians to work. This "design" is no mere accident on the part of the C.P.S. public relations personnel. Past experience has shown that the local doctor actually does not know his own strength when it

comes to affecting opinion through education in local affairs.

He is therefore asked to interview the Mayor of his town, explain the objectives of Voluntary Health Insurance Week, and encourage him to issue a proclamation declaring Health Week at the start of the campaign. Another physician is assigned the local State Senator or Assemblyman who is asked to serve as Honorary Chairman during Health Week.

Still another, usually the most capable orator of the County Medical Society, is made Chairman of the Speakers' Bureau for the Week. It is his duty to assist in arranging speaking dates and to make the talk before the dinner-meeting of leading civic, business, farm and professional leaders which precedes the inauguration of Health Week.

In communities where the physicians have made a real effort to secure speaking dates before service clubs and other civic organizations during Health Week, they have found an attentive and receptive audience awaiting their exposition of the dangers of compulsory health insurance and the advantages of voluntary systems.

By word of mouth and by way of the attendant publicity they've been able to convey to the public that they are, through C.P.S., providing a sane, sensible program of low cost health protection. Physician-speakers point out the absolute necessity of maintaining their present high standards of service if medical progress is to continue. On the other hand, these professional men in their Health Week talks, have been given the opportunity to drive home the fact that "bad medicine" can be the only result when a politician separates the physician and his patient as would be the case under a system of political compulsion.

While these plans are going forward on the part of the profession, C.P.S. sales representatives plan their intensive sales campaign to capitalize upon the advertising and publicity which is generated.

A local office is opened in the community. Special letters, which the President of the County Medical Society is asked to sign, are mailed to all leading employers with appropriate literature.

Members of the sales and public relations staff of C.P.S. also schedule talks before service clubs where they get over a direct sales message to the community's opinion-moulders.

Physician members are called upon for assistance where C.P.S. representatives need "door opening" aid.

Membership continues to increase long after the con-

clusion of the campaign. The score card on some of the more recent events shows the following results:

Ventura County	2,200
Orange County	2,300
Santa Cruz County	2,000
Solano County	2,000
Kern County	1,800

It will be noted that most of the above counties are relatively small. This being the case, the per-member cost in certain instances is higher than C.P.S.'s ordinary operation.

Certain reasonable accounting changes are now being contemplated to assess this additional expenditure to public relations and not make it a direct charge against selling.

Campaigns in the larger metropolitan areas such as Los Angeles, San Francisco, Alameda and San Diego Counties, are planned for early in 1947. Health Week in Sacramento County, no doubt, will be conducted while the Legislature is in session next Spring.

Enlarging upon the experienced gained while offering C.P.S. protection to Farm Security Administration borrowers, C.P.S. has now embarked upon an even wider field—a contract with the California State Grange.

There are more than 20,000 Grange members in the State. The members, plus their families, plus their employees and their families, offer a great new potential field of more than 50,000 persons—all eligible for C.P.S.

The enrollment program is now under way. C.P.S. representatives have explained the "C.P.S.-Grange Cooperative" to 291 individual subdivisions of the Grange at every nook and corner in the length and breadth of our great State.

Grange members, hardy exponents of free enterprise and American initiative, have been quick to realize the importance of maintaining high medical standards in California. To date, through their cooperation, 84 Granges, representing a total of more than 7,000 persons, have enrolled. All of these groups have met the 50 per cent participation requirement.

And, once the plan explained, Grange members themselves have handled the details of enrollment.

This daring venture on the part of C.P.S. has brought a flood of inquiries from other farm organizations both in California and throughout the Nation. It is expected to open great new vistas for enlarged rural memberships.

Incidentally, once in full swing operation, C.P.S. will be in possession of the latest and most reliable actuarial information on medical care costs for farm groups. This should serve as an accurate guide post for future operations.

Going on the theory that "you can't be sold until you're sold yourself," C.P.S. now accepts physician members, their families and their employees as beneficiaries. From C.P.S.'s immediate viewpoint, this has been an important step since it familiarizes the physician, his family and his staff with the advantages of C.P.S.—what the mem-

bership card means in time of prolonged illness or unpredictable accident.

Enrollment in this particular classification is reopened every four months. During the April sign-up, 1,899 persons were added to the C.P.S. list, bringing the total number covered to 3,800.

Support of compulsory health insurance has come from the CIO and other similar groups. Their activity in many instances has spurred otherwise conservative civic and employer groups into action in support of voluntary health insurance programs.

The California State Chamber of Commerce, Pro America, Glendale and Stockton Chambers of Commerce are among the latest important organizations to endorse the physicians' stand in opposition to State medicine.

The San Francisco Employers Council, in its most recent report to its members, declared:

"The medical profession and other groups favoring free enterprise are resisting government controlled compulsory insurance as a step in the direction of socialized medicine. They contend that these needs can best be met by an extension of existing voluntary programs.

"Many, if not most of the larger member firms of the Council already have in effect some form of medical, surgical or hospital benefits covering their employees. Until recently it was not possible for the smaller employer to procure this type of coverage because of an insufficient number of employees.

"It has been the feeling of the Board of Governors that medical, surgical and hospital coverage affords better protection and security to the employee than the granting of a few days of paid sick leave. Employees have in the past and probably in the future will be able to finance a few days' absence from work because of illness, but the expenses of medical, surgical and hospital attention at times work a severe hardship and financial strain on the employee which the prepaid plans, by distributing the cost over a large group, are designed to care for at reasonable cost to each individual."

During recent weeks enrollment has proceeded with such large employers as Bordens Dairy, The May Company and the San Bernardino Air Base.

Union Oil Company and the Texas Company, and now the Southern Pacific, have asked for a proposal for surgical and hospital care for the dependents of their employees.

The Northern California Druggists' Association, following an endorsement of the California Pharmaceutical Association, has approved an enrollment program for all drug store employees.

So grows C.P.S. . . .

And, as C.P.S. grows in favor and public acceptance and appreciation, so diminishes the probability of political medicine!

CHESTER L. COOLEY, M.D., San Francisco,
Secretary.

Notices of changes in memberships of County Societies are printed on Advertising Page 14, obituaries on Advertising Page 7, and rosters of officers of the California Medical Association and the Women's Auxiliary on Advertising Page 10.



NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Alameda County branch of the American Cancer Society has announced establishment of headquarters at 121 East 11th Street, Oakland, and has set up a booth in the H. C. Capwell store to give the public information in regard to early recognition and treatment of cancer. The booth will be staffed six days a week by volunteers from the Women's Medical Auxiliary and other women's organizations.

A blood donor center has been established at 285 12th Street, Oakland, by Cutter Laboratories. The company said that the center, which can handle more than a hundred paid donors daily, was needed to serve the increasing medical demands for human blood fraction products. This is the second such establishment set up by Cutter. The other, in San Francisco, has been in operation for the past two years.

Chamber of Commerce Survey shows that physicians interviewed are generally in favor of a new hospital in the San Leandro area. However, many doctors believe the hospital should accommodate at least 100 beds instead of the proposed 75. The favored site for the new hospital is close to San Leandro, between the easterly city limits and 150th Avenue, the survey showed.

CONTRA COSTA

Dr. Charles H. Jessup has been assigned to the staff of the Contra Costa County Hospital, Martinez. Dr. Jessup, a graduate of Marquette Medical School in Milwaukee, was recently released from the Navy. He succeeds Dr. Maurice Fishbein, who has gone to San Francisco to resume his studies. Dr. Waltn Joseph Ray also joined the County Hospital staff recently, replacing Dr. E. H. Morken, who is on vacation and leave of absence.

FRESNO

Dr. Leo M. Goodman has opened an office in the Boucher Building, 2050 Amador Street, Fresno, after four years in the Navy. Dr. Goodman was formerly the resident physician at the Fresno County General Hospital and assistant to Dr. H. M. Ginsburg, who recently resigned as director of the hospital.

Dr. Elmer Hof has resumed his Fresno practice in his newly completed nine-room clinic at the southeast corner of Olive and San Pablo Avenue. Dr. Hof, who has just returned from two years of service with the Coast Guard, received his medical training at the University of Kansas and served his internship in the Southern Pacific Hospital in San Francisco.

KINGS

The resignation of Dr. C. T. Rosson, Sr., as county physician has been announced by Chairman Russell Troutner of the Kings County Board of Supervisors. Dr. Rosson is replaced by Dr. Charles Hedges, formerly of Charleston, West Virginia.

Dr. William L. Dittes, who until recently served as a lieutenant in the Navy Medical Corps, has returned to private practice and is now associated with Dr. L. W. Sorenson in Corcoran.

LOS ANGELES

Dr. Arthur O. Stewart, who was discharged from naval service on June 15, has resumed private practice at 320 North Glendale. While in the Navy, Dr. Stewart was in charge of the department of anesthesia at the naval hospital at Long Beach.

Dr. James R. Spencer has been appointed resident in surgery at the Huntington Memorial Hospital, it was announced by officials at the hospital. Dr. Spencer, just released from active service as a Navy medical officer, attended the University of Texas Medical School, graduating as a Navy V-12 student in 1944.

Physical Medical Training for Physicians at the Los Angeles County General Hospital has been approved by the American Medical Association, according to a communication from Leroy R. Bruce, director of the institution. The present head of the physical medicine department of the General Hospital is Ora L. Huddleston, M.D., formerly with the University of Colorado and the Fitzsimmons General Hospital of the U. S. Army at Denver.

Lt. Col. Kenneth W. Taber of the U. S. Army Medical Corps has just received a three years' appointment to Johns Hopkins Medical School through the Dean's Committee and will specialize there in radiology and cancer research. Before serving with the Army, Colonel Taber practiced medicine for 13 years in Pasadena and during that time was on the faculty of the University of Southern California Medical School.

Dr. Charles C. Levy who recently returned from overseas service, has opened an office at his home, 720 Screenland Drive, Burbank.

Dr. Albert J. Miller of Azusa has announced his intention to enter medical practice in Monrovia. He will be associated with Dr. Robert E. Crusan. Dr. Miller returned from overseas service with the Army about two months ago. Much of his time with the Army was spent at Heidelberg University where he engaged in medical research.

Dr. Roy O. Gilbert of Sherman Oaks became acting county health officer for Los Angeles County July 1 when the resignation of County Health Officer H. O. Swartout became effective. Dr. Gilbert's appointment covers the months of July and August. On September 1 the Board of Supervisors is expected to set up a County Health Commission which would serve in conjunction with Los Angeles City Health Officer George M. Uhl to administer health affairs of all cities of the county, including Pasadena, Long Beach, Beverly Hills and Vernon asking them to join with the City of Los Angeles in becoming part of a unified county health program.

MADERA

Dr. Ellis D. Jamison has been appointed by the Madera County Board of Supervisors as resident physician of the Madera County Hospital to succeed Dr. Roland Young, who resigned to practice in Quincy. Dr. Jamison graduated from Stanford University and served his internship in the Fresno County Hospital. He was recently discharged from the Army.

ORANGE

Wintersburg Grange was the first in Southern California to report a majority sign-up of members for benefits of the State Grange-California Physicians Service prepaid health cooperative. Many other Granges in Southern California are now actively engaged in obtaining sufficient sign-up of members to qualify for C.P.S. affiliation. It is expected that a considerable number of them will report success.

SAN DIEGO

Dr. Stephen E. Flynn has returned to Coronado after having been absent since the beginning of the war. Dr. Flynn was senior medical officer aboard the cruiser USS Columbia and received the Bronze Star and Navy Unit Commendation for meritorious conduct in line of his profession at Lingayen Gulf, Philippine Islands, in January, 1945. Dr. Flynn's new office is located at 1024 Isabella Ave.

SAN FRANCISCO

Dr. William McDowell Hammon, noted University of California epidemiologist, has been appointed dean of the school of public health on the Berkeley campus of that institution. Dr. Hammon, a leading authority on encephalitis, was called to Okinawa during the war to aid in controlling outbreaks of the Japanese "B" encephalitis among American troops. Earlier this year he went to Tokyo to advise General Douglas MacArthur's command on the same subject. Dr. Hammon received his M.D. at the Harvard Medical School and a degree of Doctor of Public Health at Harvard. He also studied in Belgium and was a member of a hospital staff in the Belgian Congo. He replaces Dr. Walter H. Brown, who recently retired.

Dr. Philip K. Gilman, former president of the California Medical Association, has been installed as president of the Society of State Medical Associations. He succeeds Dr. Andrews Brunk of Michigan.

SAN MATEO

Dr. William G. Schmitz and **Dr. Philip Vogel**, both recently discharged from the Army's medical service, have leased offices in the Bachelder Building, 201 Broadway, Millbrae, where they will be associated in private practice.

Return of 22 doctors to practice after serving in the armed forces is announced by officials of the San Mateo County Medical Society. Resuming their practices are Doctors E. G. Gamette, V. H. Heinz, Gordon Morrison, P. A. Seeley of Burlingame; Paul Anzinger, J. G. Bridgeman, T. E. Farthing, J. K. Hazel, O. M. Holmes, Martin Karr, William Layton, A. G. Miller, W. W. Mills, R. R. Moulton of San Mateo; Norman Fox, Werner Glasser, Harry Smith, of San Bruno; Bard Berry, Dewey F. Brown, W. B. Hurlbut of Redwood City; R. D. Borley of Half Moon Bay, and S. J. Guardino of Brisbane.

SANTA CLARA

Dr. W. Elwyn Turner has replaced Dr. Cecil M. Burchfiel as county health officer of the Santa Clara County Board of Supervisors. Dr. Burchfiel's resignation was accepted with regret. Under his direction the staff of the department was increased and the scope of the work enlarged. Dr. Burchfiel is a graduate of Washington Medical School in St. Louis.

RIVERSIDE

Dr. Earl M. Edison has opened offices at 1317 East Las Tunas Drive, San Gabriel, in the premises occupied

by Dr. Raymond O'Connell. Dr. Edison, a graduate of Northwestern University, has been out of the Army approximately eight months, during which time he has been associated with Dr. Lawrence Butka of Alhambra.

TULARE

Dr. Rodney F. Wood has opened offices at 132 North M Street, Tulare. Dr. Wood recently returned from military service.

Stanford University School of Medicine has announced 11 postgraduate medical courses for practicing physicians, and the **University of California Extension Division** will offer three. All the courses begin in September, all will be held in San Francisco.

The Stanford courses, given in cooperation with the San Francisco Department of Public Health and the San Francisco Hospital, include Internal Medicine, Pediatrics, Ward Rounds in Surgery, Obstetrics and Gynecology, Otorhinolaryngology, Cardiovascular Disease, Hypertension and Nephritis, Surgical Anatomy and Operative Technique, Proctology, Ophthalmology, and Anesthesiology. They will be given September 2-6, inclusive. In addition there will be a general meeting on Arthritis, in Lane Hall, Tuesday evening, September 3, and another on Thoracic Surgery at the same place the following Thursday evening.

U. C. Extension courses include: Venereal Disease Diagnosis, Treatment, and Control, with lectures beginning September 13 and ending January 10, 1947; Internal Medicine, beginning September 23 and continuing to December 9; A Refresher Course in Psychiatry, to be given at the Langley Porter Clinic, starting September 16 and continuing for 12 weeks.

Distribution of a questionnaire to physicians as a part of a nation-wide study of Child Health Services is planned for early September, it is announced by the American Academy of Pediatrics which is conducting the study. Purpose of the questionnaire is to determine the extent and availability of existing child health facilities in each community.

The questionnaires are simple, one-page forms and are to cover one specific day of the week.

"Cooperation of physicians in furnishing the required information for study is essential for the success of the program," the Academy says, "and it is important that the questions be answered correctly and for the specified time, even though that day may not be representative of the answering physician's practice, so that an accurate over-all picture can be obtained."

The Academy's announcement says that the entire program has been approved by the American Medical Association, California Medical Association, California Dental Association, and the State pediatric groups.

Inquiries may be addressed to the American Academy of Pediatrics Study of Child Health Services, 2180 Washington Street, San Francisco, 9.

Appointment of four California surgeons as consultants to the Secretary of War through the Surgeon General has been announced by the War Department.

The four from California, who are among 74 physicians and surgeons in the country named to similar positions, are: Sterling Bunnell, San Francisco, plastic surgeon; and three general surgeons—Meridith Beaver of Redlands, Carleton Mathewson of San Francisco, and Gordon K. Smith, Los Angeles.

"Appointments were made," the War Department said,

(Continued on Advertising Page 46)

INFORMATION

THE PHYSICIAN AND MEDICAL-LEGAL PHASES IN THE ADOPTION OF CHILDREN*

DONALD G. TOLLEFSON, M.D., *Los Angeles*

The placing of a newborn infant in the hands of foster parents bears a great legal as well as moral responsibility. Physicians should be thoroughly conversant with the laws of the State of California which require that relinquishing of any child for adoption must be handled by a licensed agency, or through the State Department of Social Welfare. The interests of the real parent, the foster parent and, above all, the child are entitled to protection which this method provides.

The importance of the whole problem of adoption has been brought to the attention of the medical, legal and social welfare professions and a committee has been studying this problem for the past year. Certain facts will emphasize the need for such a study. Locally as well as nationally there exists what is popularly known as a "black market" in babies. Unscrupulous doctors, lawyers, and other greedy individuals have taken newborn infants away from their mothers and placed them with some young couple unable to have a child of their own, the couple paying the so-called expenses in order to obtain the baby. Many girls finding that they are pregnant will accept readily any suggestion which will take from them the responsibility for the baby's care as well as their own. Probably two-thirds of the babies for adoption are from these mothers. The number has increased in astounding proportions during these war years. Licensing of child placement agencies is required in 30 states, including California. (This was done by Congress for the District of Columbia by passing the so-called "Baby Broker's Bill".)

The demand always exceeds the supply of babies. Therefore, it is not surprising to find 5,132 petitions were filed by foster parents in California last year and over 5,000 applications are on file with the two approved agencies to adopt infants.

Last year, 917 children were relinquished to the licensed agencies for these 5,000 petitioners. In addition, 2,931 independent adoptions were filed and were investigated by the State Department of Social Welfare. The proper method of procedure for doctors is to refer the baby as well as prospective foster parents to the licensed agencies, which after accepting the relinquishment of the child are able to study the particular infant and select a home best suited to his needs. The problem is, therefore, to increase the facilities for the handling of adoptions by expansion of the present licensed agencies by increased financial support through donations, direct grants or subsidies by the state, and by increasing the number of such agencies under either private or public auspices.

The small number cared for by the present agencies has caused many physicians and lawyers, who are the contacts with prospective petitioners, to make private placements which lead to independent adoptions. Doctors are besieged by patients who cannot have children by reason of sterility. An unwed mother comes to the doc-

tor—she may come from a neighboring city, possibly from one of the doctor's colleagues. He is asked to care for her at a reduced fee and he knows of a couple wanting a baby. He explains to the expectant mother that he will see that the baby is cared for, and as soon as the baby is born all she has to do is to release the baby to some second person, thus relieving her of responsibility and assuring that her identity will be concealed. This is the first mistake. Hospitals must notify the State Department of Social Welfare when a baby is released to any person other than the parent, and a representative of the State Department must be present when the mother signs the consent to the adoption. The necessary investigation of either the child or the home is made after the placement. The best interest of the infant may not be served in that particular environment. Since the placement precluded adequate knowledge of the child and home, the child's welfare is not properly safeguarded.

Once the child is placed in the home, what if the child's development results in some unforeseen abnormality? What if he or she is a mental defective? What if serious health or other problems of the adoptive parents appear? It would be far better to have a period during which the child and the adoptive parents are observed, and during which petitioners and the child can be matched as to religion, nationality and cultural background. Again, what chances the foster parents take when the unwed mother may see on the paper she signs the name of the petitioners and their address! She may not look, but it is a possibility. Also, what about the doctor if this unwed mother comes back and says, "Doctor, where is my baby?" Or, "I made a mistake; I want my baby back!"

This is the problem in which you are vitally involved. Knowing the dangers to everyone concerned, you can avoid making irregular placements.

Laws of various other states are being studied as well as present California statutes, in order to make such changes as will protect all persons concerned in adoptions. Our duties to the unwed mother and to her child, as well as to our eager patients who want an adopted child, should be governed by the experience of our State Department of Social Welfare.

1. An unwed mother should be referred to a social agency as soon as she comes under the physician's care.
2. Petitioners desirous of obtaining a child by adoption should be referred to a licensed agency of the State Department of Social Welfare.
3. Do not take the responsibility of an independent adoption placement.
4. Do not deliver a baby and make arrangements with a third person to pay the bill with the guarantee that the baby can be adopted.
5. Obey the law and encourage any legislation or campaign to make available care for more infants during the period when they may be observed or studied.

511 South Bonnie Brae.

* Read before the Second General Meeting at the Seventy-fifth Annual Session of the California Medical Association, Los Angeles, May 7-10, 1946.

Letters to the Editor . . .

MILK-BORNE CARCINOGENIC VIRUS

In 1936 it was shown by Bittner¹ that the apparently spontaneous mammary cancer in certain strains of mice is due to an "influence" or "incitor," transferred by nursing from the mother to the new-born young. Young born of the carcinophilic strain and foster-fed by mothers free from this apparently hereditary taint seldom if ever develop spontaneous breast cancer in late life. Young born from cancer-free strains and foster-fed by carcinophilic mothers often developed lethal breast cancer. It was afterwards shown that the same "incitor" may be demonstrated in either spontaneous or transplanted mammary cancer of mice² or in apparently normal lactating mammary tissues³ of certain strains.

The active agent is present in cell-free filtrates from mammary carcinoma.⁴ Tests were made on 4 or 5 week old females which had parents that did not transfer the influence in their milk but which had the inherited susceptibility for spontaneous mammary cancer. These young mice were inoculated intraperitoneally with Berkefeld filtrates from carcinoma tissues. In a typical group of 10 mice inoculated with such filtrates, 8 died and in a second group of 22 mice similarly inoculated, 12 died of spontaneous mammary cancer by the end of 12 months. The incidence of mammary cancer in several hundred uninoculated controls was less than 1 per cent.

These data suggest that the carcinogenic "influence" is a filtrable virus. If so, the "influence" presumably multiplies or is multiplied in symbiosis with mammary tissues. To test this possibility, 10 serial transplants of carcinoma tissue were made in mice that did not themselves carry the active milk agent. Berkefeld filtrates from the 10th serial passage caused the development of lethal mammary cancer in 8 out of 12 injected mice. There is thus evidence of the continuous production of the active agent within the transplanted tumor cells. Attempts to propagate the "influence" in embryonated hens eggs, thus far have not been very convincing, even though the milk agent survives for 12 days in the yolk sac in the absence of living mouse cells.

In order to obtain further evidence in support of the virus theory, Green⁵ and his associates of the University of Minnesota studied the antigenic properties of the mouse-tumor agent. To do this, high-speed centrifugates from mouse mammary carcinoma filtrates were repeatedly injected into rabbits and white rats, both spontaneous mammary tumors and transplant tumors being used in making the filtrates. Control injections were made with filtrates from normal mouse tissues. Seven to ten days after the 5th injection serums were drawn from the injected animals, and tested for their possible virucidal action on the mouse-tumor agent.

To do this, centrifugate equivalents of 0.2 g. tumor tissue were suspended in 0.5 cc. saline solution and mixed with 0.18 cc. antiserum. After 2 hours standing at room temperature, 24 4-week old mice were injected with each mixture. Of 48 control mice injected with virus alone or with a mixture of virus and an antiserum against normal mouse tissues, 39 or 80 per cent developed breast tumors by the end of 13.5 months. Of 48 mice injected with a mixture of virus and specific antiserum (anti-milk "influence"), not a single case of breast tumor developed during the same period of time.

These findings confirm the earlier hypothesis that the milk agent is of exogenous origin. Whether or not the specific virucidal antiserum would be therapeutically

effective in mice already infected with the milk-borne virus has not yet been tested.

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PROTEIN-REPLETION THERAPY

In 1942 it was shown by Cannon¹ of the Department of Pathology, University of Chicago, that antibody formation is largely a function of protein reserves. Rabbits whose protein reserves had been reduced by plasmapheresis or prolonged low protein diets usually produced agglutinins of but one-fifth the titer of agglutinins produced by well-fed controls.

His implied theory of acquired immunity was of particular interest at that time due to its application to the epidemiology of infectious diseases under wartime conditions. Cannon² subsequently found that there is a positive correlation between protein deficiency and surgical infection. It therefore became of practical clinical interest to determine how promptly and effectively protein depletion can be corrected by dietary measures.

To test this³ groups of adult white rats were placed on a protein depletion diet. The diet usually contained less than 2 per cent protein, with compensatory increases in non-protein factors so as not to reduce caloric intake. Vitamin intake was left constant. By the end of 83 to 191 days, there was 30 to 40 g. loss of body weight, and a 30 per cent reduction in hemoglobin and serum proteins. These depleted rats were then injected in the tail vein with washed sheep erythrocytes. They produced antiserums averaging 560 hemolytic units per cc. by the end of 6 days. As controls, normally fed rats were similarly injected. They produced antiserums averaging 560 hemolytic units per cc. by the end of 6 days. As controls, normally fed rats were similarly injected. They produced antiserums with an average hemolytic titer of about 8,000 units per cc. by the end of the same period, or 14 times the antibody titer of the depleted rats.

Protein-repletion tests were now made on other groups of depleted rats. To do this dehydrated beef, lacaalbumin or proteinhydrolysate ("amigen") were added to the depletion diets in such a way as to increase the protein (or its equivalent) to about 20 per cent. There was practically no change in daily vitamins or caloric intake. Animals on these repletion diets made satisfactory weight recoveries (2.05 to 2.96 g. per cent) by the end of 7 days. During this 7-day recovery period, injection of washed sheep erythrocytes led to the production of antiserums of an average hemolytic titer of 3,830 units per cc. by the end of 6 days. This was nearly 7 times the average titer in depleted rats. A 2.6-fold improvement was seen after only 2 days protein-repletion feeding, increasing to

nearly a 10-fold increase by the end of 7 days therapeutic feeding.

Depression of specific antibody function by protein depletion is therefore reversible. Feeding with high-quality protein or its equivalent will therefore restore within about 7 days a depleted animal's ability to produce antibodies of relatively normal titer. These findings suggest that it is not only important in a rehabilitation program to feed severely undernourished persons rations high in calories and vitamins, but also rations containing an adequate amount of high-quality proteins or their equivalent, particularly when bacterial infection is present or impending.

The exact mechanism whereby protein depletion de-

presses specific antibody production and protein repletion re-establishes it is still undetermined.

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BOOK REVIEWS

A BIBLIOGRAPHY OF INFANTILE PARALYSIS WITH SELECTED ABSTRACTS AND ANNOTATIONS—1789-1944. Prepared under direction of the National Foundation for Infantile Paralysis, Inc. Edited by Morris Fishbein, M.D., Editor, *Journal of the American Medical Association*; compiled by Ludvig Hektoen, M.D., Chief Editor, *Archives of Pathology* and Ella M. Salmonson, Medical Reference Librarian, John C. Crerar Library, Chicago. Cloth. Pp. 672. Philadelphia, London, Montreal: J. B. Lippincott Company, 1946.

The last comprehensive survey of the literature on poliomyelitis was that of the Milbank International Committee published in 1932. During the 14 years that have since elapsed the many workers in that field have increasingly felt the need of another and more complete bibliography. The Milbank report consisted of a series of reviews of various phases of the subject and its bibliography contained only 830 of the more than 5,000 items which the present volume shows had been published up to that time. The latter contains over 8,400 references for the period ending with 1944, a striking witness to the tremendous interest which poliomyelitis has attracted in the medical profession and its ancillary services.

The arrangement of the present volume is admirable. The articles are consecutively numbered and listed by year, those within each year being given alphabetically. At the end of the volume is an index of authors followed by a subject index. The latter, while occupying 94 pages and extraordinarily detailed, is not absolutely complete. The important study of Rissler, for example, in which the first detailed histopathological study of acute poliomyelitis was presented, is not listed under Pathologic anatomy nor under Pathology, probably because of its undescriptive title. An occasional omission of this sort is, of course, humanly unavoidable. Brief but usually adequate abstracts of papers of more than ordinary interest are given.

Of special interest to Californians is the fact that the first case report from this state (of a patient from Eureka) appeared in 1874-75 in the *Pacific Medical and Surgical Journal* under the name of G. M. Kober. The first recorded epidemic here, that of 1901 consisting of 55 known cases, was reported by Alice M. Woods in 1903 in the *Occident Medical Times*. The epidemic of 1910 was still larger, necessitating the appointment of a committee for the Study of Anterior Poliomyelitis in San Francisco under the chairmanship of the late E. C. Fleischner; its report in the *California State Medical Journal* was published in 1911 and recorded 139 or more cases. It was not until this time or shortly thereafter that the disease was officially listed and systematically reported in public health reports. For this state as elsewhere it is impossible to obtain an accurate estimate of

the prevalence of poliomyelitis in the nineteenth and early part of the twentieth century because reporting was casual and haphazard and the disease was classified with meningitis and other infections of the central nervous system. But the bibliography clearly indicates that the disease which during the last four decades has occurred in such large epidemics in the temperate zones began with sporadic cases and small outbreaks and took more than a century to reach its recent proportions.

The reviewer has not time nor space to discuss the many other interesting facts disclosed by the present volume, such as the development of our present knowledge of the pathology, epidemiology, clinical aspects, experimental research, and therapy, but they are covered with gratifying completeness and ease of reference. The medical world is deeply indebted to the National Foundation for Infantile Paralysis and to the labors of the editors of the bibliography for a notable addition to its armamentarium. Special commendation is due for the handsome format and conspicuously legible typeface of the volume.

PHYSICAL CHEMISTRY OF CELLS AND TISSUES. By Rudolf Hober, University of Pennsylvania School of Medicine, Philadelphia, Pa.; with the collaboration of David I. Hitchcock, Yale University School of Medicine, Laboratory of Physiology, New Haven, Conn.; J. B. Bate-man, Mayo Clinic, Rochester, Minn.; David R. Goddard, University of Rochester, Biological Laboratories, Rochester, N. Y., and Wallace O. Fenn, University of Rochester, School of Medicine and Dentistry, Rochester, N. Y. Cloth. Price, \$9.00. Pp. 676, illustrated. Philadelphia: The Blakiston Company, 1945.

As the title indicates, this book is for the experimental investigator of fundamentals of biological function, chiefly cells, including living and non-living models. This approach has been of unquestionable value in shedding light on the physico-chemical nature of living function, but the reader may sometimes wonder whether the devotees of this approach are making physiology the handmaid of physics and chemistry, for their sake, or whether the nature of living function is being explained in and for itself. Woodger has pointed out the serious limitation to, if not fallacy of, attempting to account for biological phenomena according to laws of physics and chemistry, and he gives many examples in his own book where these inanimate sciences fail conspicuously to elucidate striking and common every day phenomena. It would seem there is something "vital" (perhaps a poor term) or peculiar to the behavior of living tissues which must be taken into account for a better understanding of function than merely physics and chemistry. For instance, selectivity,

reflex actions, especially the protective or purposive kind, sensitization and a host of other biological reactions cannot as yet be explained on a strictly physical-chemical basis. Since the structure of protoplasm is not fully understood, it must be difficult to apply the laws of physics and chemistry for a better understanding of it. Of course, the authors of this book do not claim to have the key to the mysteries of the living cell, but they have certainly done their best in applying mathematics and the laws of physical chemistry to get the better understanding. Without a good grounding in these precision sciences the material in this book cannot be comprehended and therefore it will be of no interest to physicians in general.

For students of medical and biological sciences, however, a deeper though generally limited insight may be obtained into the following subjects considered in the book: cell surface activity, permeability, cellular and tissue respiration, respiratory enzymes, fermentation, contractility of skeletal muscle, intestinal absorption, urine formation, elaboration of digestive juices, and transfer mechanisms for ions, water, etc. The senior author and his four collaborators are well known specialists in the physico-chemical basis of living phenomena and have given the expert treatment to the subjects considered. This book should be thought provoking and stimulating to investigators of fundamentals in biology and medicine.

DISEASES OF THE SKIN FOR PRACTITIONERS AND STUDENTS. By George Clinton Andrews, A.B., M.D., Associate Clinical Professor of Dermatology, the College of Physicians and Surgeons, Columbia University; Chief of Clinic, Department of Dermatology, Vanderbilt Clinic; Chief of Dermatology Clinic, Roosevelt Hospital; Attending Dermatologist to Presbyterian Hospital and Roosevelt Hospital; Consulting Dermatologist and Syphilologist to Tarrytown Hospital, Grasslands Hospital, Valhalla, St. Johns Hospital, Yonkers, Greenwich Hospital and the Beekman-Downtown Hospital; Fellow of the American Medical Association, of the American College of Physicians, and the New York Academy of Medicine; Member of the American Dermatological Association, the American Radium Society, the New York Dermatological Society, New York Roentgen Society, and the Manhattan Dermatological Society; Member of the Deutsche Dermatologische Gesellschaft and Corresponding Member of the Société Française de Dermatologie et de Syphiligraphie. Third edition with 971 illustrations. Cloth. Philadelphia and London: W. B. Saunders Company, 1946.

The third addition of Dr. Andrews' text on Diseases of the Skin is most timely and welcome. It covers completely the common and rare forms of skin disorders as well as all venereal diseases except gonorrhea. Many new skin diseases have been added.

The chapters on superficial x-ray therapy and radium therapy are enlarged and brought up to date. The section on tropical skin diseases is concise, well written and important to all who see patients, who have contracted diseases in the South Pacific. The discussion of the various allergic dermatoses is comprehensive and well done and does not occur in other texts of dermatology. The chapter on fungus diseases has been entirely rewritten and modernized. Dermatological therapy has been completely revised and modernized. Excellent formulas are given for the treatment of all the various skin diseases.

Syphilis is covered well and the new methods of rapid treatment of early syphilis and the use of penicillin in syphilis is discussed. Chancroid, lymphopathia venereum, granuloma inguinale are concisely covered.

Another addition which makes this book more valuable is the inclusion of references at the end of each chapter.

The only criticism offered here is that Dr. Andrews has omitted from this edition the use of thallium acetate for epilation of children with tinea capitis due to micro-

sporum audouini and the omission of curette and fulguration or cautery of superficial epitheliomas of the skin. Both of these methods are used frequently in many teaching university hospitals and certainly deserve a place in any book on skin diseases.

The great amount of information in the text, together with the excellent black and white photographic illustrations, bibliography and concise manner of presentation, makes this a most valuable book for students and practitioners of dermatology and syphilology. It is one of the best books on this subject to date.

NARCOTICS AND DRUG ADDICTION. By Erich Hesse, M.D. Cloth. Price, \$3.75. Pp. 219. New York: The Philosophical Library, 1946.

The author places addicting drugs in two groups, the narcotics, and the stimulants. The former are defined as being truly dangerous, the latter, as relatively harmless, but they are alike in producing a subjective feeling of well-being which makes it possible to "forget the troubles of the world for a while." Among the narcotics are opium, coca, mescaline, hemp, and kava-kava; among the stimulants are alcohol, tobacco, the purines, and betal. Each is considered briefly, from the standpoint of history, chemistry, pharmacology, and social significance.

The book is a strange mixture of dogma and science. The author feels that the use of any of these drugs is wicked, but that as mankind refuses to be entirely good, habituation must be accepted, and efforts directed toward replacing the use of narcotics with the reasonable use of the stimulants.

The book is a translation from the German, and appears to be literal to the point of ineptness, and to have been made by a non-medical person.

AUTOPSY DIAGNOSIS AND TECHNIQUE. By Otto Saphir, M.D., Pathologist, Michael Reese Hospital; Professor of Pathology, University of Illinois Medical School, Chicago. Foreword by Ludvig Heftken, M.D. Second edition, revised and enlarged. Leather. Pp. 405, illustrated. New York, London: Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, 1946.

This manual presents in detail a modified Rokitansky method for the performance of post mortem examinations. The technique is clearly stated and well illustrated. For each step of the examination the text supplies adequate descriptions of the gross anatomic findings most commonly encountered and provides numerous tables of differential diagnosis based on these appearances. By limiting the presentation to that of a single method confusion is avoided, and the inexperienced or occasional prosector is assured of performing a complete examination if he intelligently follows the ample instructions.

The book is particularly valuable for those beginning or resuming the study of autopsy technique as medical students, interns, residents or practicing physicians performing an occasional examination. It is a guide and handbook. It is not intended as a textbook of pathology nor does it offer the special techniques employed by experts in the unusual case as, for instance, in certain medico-legal problems. The sole emphasis is upon gross morbid appearances with perhaps insufficient directions for the preservation of specimens for toxicologic, bacteriologic or serologic investigation.

This second edition is enlarged by sixty pages representing the addition of several new chapters (the Nose and its Accessory Sinuses, Autopsies on Stillborns and Infants, Anatomic Findings in Vitamin Deficiencies, and Notes on Certain Tropical Diseases); and by the expansion of several of the former sections notably those on accidental deaths and on the examination of the breast.

COSMETICS AND DERMATITIS. By Louis Schwartz, M.D., Medical Director, U. S. Public Health Service; Chief, Dermatoses Section, Division of Industrial Hygiene; Adjunct Professor in Dermatology, Georgetown University School of Medicine; Associate Clinical Professor in Dermatology and Syphilology, New York University College of Medicine; Consultant, Office of Price Administration, and Samuel M. Peck, M.D., Medical Director (R), U. S. Public Health Service; Associate Attending Dermatologist, Mt. Sinai Hospital, New York City; Attending Dermatologist and Syphilologist, Skin and Cancer Unit of the New York Postgraduate Medical School and Hospital of Columbia University; Diplomate of the American Board of Dermatology and Syphilology. Cloth. Price, \$4.00. Pp. 189. New York, London: Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, 1946.

The authors are competent authorities to discuss the subject covered by this book. The word, "cosmetics" is used by them rather broadly, including soaps and dentifrices, and there is little to criticize so far as statement of facts is concerned.

One wonders, however, to whom this book would be of particular interest. Certainly to the dermatologist worthy of the name there is nothing new, and reporting new chemicals as allergens is of comparatively little value since every case presenting itself offers a detective problem no matter how conversant the specialist is with the whole subject of cosmetics. For the general practitioner the problem is largely one of differential diagnosis and much of this he could long ago have gathered from textbooks on dermatology. If he will get really interested in this subject the book may prove of some value to him. The intelligent public has long been familiar with the problem of allergy in a confused manner and it is questionable whether the book will be of much further help to it. Surely the manufacturer has long had to face the problem, including the chemist particularly interested in the manufacture of these preparations.

Possibly all of these various groups may get a little enlightenment from this book, and in that sense coming from the Public Health Service it may fill a want. It is difficult for the reviewer to wax enthusiastic over a book of this type.

PREOPERATIVE AND POSTOPERATIVE TREATMENT. Edited by Lt. Col. Robert L. Mason, M.C., A.U.S., Cushing General Hospital, Framingham, Massachusetts, and Harold A. Zintel, M. D., Harrison Depart-

ment of Surgical Research, University of Pennsylvania School of Medicine; Assistant Surgeon, Hospital of the University of Pennsylvania. Second edition, illustrated. Cloth. Pp. 584. Philadelphia and London: W. B. Saunders Company, 1946.

This book is a revision of the 1937 edition. Mason, Zintel, and their collaborators have done an excellent piece of work and this edition brings it up to date. The book is divided into two parts. The first part covers general considerations of pre- and post-operative management; the second part applies these principles to regional surgery and describes the surgical treatment of regional conditions as well. The first few chapters are devoted to preoperative considerations and the evaluation of the various factors which influence the operative risk. They discuss the conditions which require special therapy and outline their management. The chapters on water balance, acidosis and alkalosis are particularly well done and the reader is given a practical outline of their management both preoperatively and postoperatively. In general, not only the diagnosis, care, and management of everyday problems but the unusual complications as well are covered. The importance of many of the little things which we are likely to overlook in the care of the patient are stressed together with the more obvious considerations. The second part deals with the surgical treatment of regional conditions in an excellent manner. Physiology is considered from a wholly practical standpoint as a basis for therapy. Indications and contraindications for various surgical procedures are discussed and postoperative care is outlined in detail. The best current opinion is liberally interspersed with the author's views in a manner which gives the reader a broad view of the points under discussion. The information on penicillin and thiouracil is not quite up to date but in view of the changing picture in regard to these products the information contained in this book is sound. The book is easy to read and to use as a reference work. It is well indexed and there is an extensive bibliography. An appendix of findings in the blood and urine in health and disease constitutes a valuable source of quick reference and information. All surgeons should have the book in their libraries and individuals who are preparing for a surgical specialty should find it invaluable.

